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**Iranian Ballistic Missile Threat and a "Phased, Adaptive Approach" for Missile Defense in Europe: Perceptions, Policies and Scenarios**

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September 15, 2010

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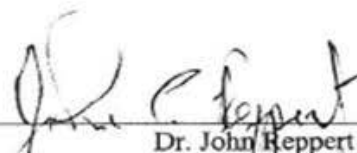
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## **ABSTRACT**

The threats posed by Iran's ballistic missiles and the nexus of Iran's ballistic missile and nuclear programs are of great concern to the U.S., the North Atlantic Treaty Organization (NATO), and the international community. While Iran claims its missiles are defensive in nature and its nuclear program is for peaceful purposes, insufficient transparency on Iran's part leaves much uncertainty about these programs. A nuclear armed Iran with a ballistic missile capable of delivering a nuclear weapon would significantly threaten regional and international security.

To mitigate the threat, the international community has gone to great lengths to engage Iran diplomatically. The U.S., NATO and Middle Eastern countries have also engaged in threat mitigation activities including non-proliferation, sanctions and missile defense. In September 2009, President Obama announced a new U.S. missile defense policy, a Phased Adaptive Approach (PAA) for Europe. The declared purpose of the PAA is to counter the Iranian ballistic missile threat. In light of the threat and the new U.S. approach, NATO is considering making missile defense of Alliance territory a NATO mission at the Lisbon Summit in November 2010.

The purpose of this advanced research project is to analyze the threat to NATO posed by Iran's ballistic missile program and to analyze U.S. and Allies' missile defense plans for Europe. This paper argues that while U.S. and NATO missile defense plans for Europe are sufficient to defend against a medium-range ballistic missile attack from Iran for the foreseeable future, defense against a potential Iranian intercontinental ballistic missile is less certain. It also finds that the U.S. PAA avoids hard-line Russian resistance and reassures U.S. allies by investing in their nations' defense infrastructures. Finally, this paper presents potential future scenarios and provides recommendations for U.S. and NATO policymakers as they consider missile defense and options to deal effectively with the threat posed by Iran's ballistic missile program.

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I want to thank my wife and children. They are a constant source of love and support.

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LTC Johnson is married to the former Kirsten A. Howe. They have five children: Sarah, Rachel, Rebekah, Jacob and Joseph.

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## ACRONYMS

AA	Aegis Ashore
ABL	Airborne Laser
ABM	Anti-Ballistic Missile
ADCF	Air Defense Command Frigates
AEOI	Atomic Energy Organization of Iran
ALTBMD	Active Layered Theatre Ballistic Missile Defence
AN/TPY-2	Army Navy/Transportable Radar Surveillance System
BMD	Ballistic Missile Defense
BMDR	Ballistic Missile Defense Review
BMDRR	Ballistic Missile Defense Review Report
BMDs	Ballistic Missile Defense System
C2	Command and Control
C2BMC	Command and Control, Battle Management, and Communications
CENTCOM	U.S. Central Command
CFE	Conventional Forces in Europe
CIA	Central Intelligence Agency
CRS	Congressional Research Service
DIA	Defense Intelligence Agency
DNI	Directory of National Intelligence
DoD	Department of Defense
EPAA	European-based Phased Adaptive Approach (also PAA)
EU	European Union

EUCOM	U.S. European Command
EWI	EastWest Institute
GBI	Ground-Based Interceptors
GMD	Ground-Based Mid-Course Defense
HCOC	Hague Code of Conduct
IAEA	International Atomic Energy Agency
IC	Intelligence Community
ICBM	Intercontinental Ballistic Missile
IOC	Initial Operational Capability
IRBM	Intermediate-Range Ballistic Missile
IRGC	Islamic Revolutionary Guard Corps
MDA	Missile Defense Agency
MEADS	Medium Extended Air Defense System
MRBM	Medium-Range Ballistic Missile
MSE	Missile Segment Enhancement
MTCR	Missile Technology Control Regime
MW	Megawatt
NASIC	National Air and Space Intelligence Center
NATO	North Atlantic Treaty Organization
NCRI	National Council of Resistance on Iran
NGO	Non-Governmental Organization
NPT	Nuclear Non-Proliferation Treaty (also NNPT)
NRC	NATO-Russia Council

OIF	Operation Iraqi Freedom
PAA	Phased Adaptive Approach (Also EPAA)
PAC	Patriot Advanced Capability
PACOM	U.S. Pacific Command
PSI	Proliferation Security Initiative
PTSS	Precision Tracking Space System
SLV	Space Launch Vehicle
SM-3	Standard Missile-3
SRBM	Short-Range Ballistic Missile
TEL	Transporter-Erector-Launcher
THAAD	Terminal High Altitude Area Defense
TMD	Theater Missile Defense
UAE	United Arab Emirates
UEWR	Upgraded Early Warning Radar
UN	United Nations
UNSC	United Nations Security Council
UNSCR	United Nations Security Council Resolution
WMD	Weapons of Mass Destruction

## **CHRONOLOGY OF KEY EVENTS**

- 1968 (JUL) Nuclear Non-Proliferation Treaty (NPT) Signed (Iran signed and ratified)
- 1972 (MAY) U.S. and Soviet Union Sign Anti-Ballistic Missile (ABM) Treaty
- 1974 (MAY) Iran Concludes Comprehensive Safeguards Agreement with the IAEA
- 1979 (JAN) Fall of the Shah of Iran
- 1979 (APR) Islamic Republic of Iran Established
- 1979 (NOV) Iran Hostage Crisis Begins
- 1980 (APR) U.S. Breaks Off Diplomatic Relations with Iran
- 1980 (SEP) Start of Iran-Iraq War (origins of Iranian ballistic missile program)
- 1981 (JAN) Iran Hostage Crisis Ends
- 1981 (JUN) Israeli Air Force Attacks Iraqi Reactor near Baghdad
- 1987 (APR) Missile Technology Control Regime (MTCR) Established
- 1988 (AUG) Iran-Iraq War Ends when Iran Accepts Terms of UNSC Resolution 598
- 2001 (DEC) U.S. Announces Withdrawal from ABM Treaty
- 2002 (MAY) NATO-Russia Council (NRC) Established
- 2002 (AUG) NCRI Releases Information on Natanz Nuclear Enrichment Site
- 2002 (SEP) Iranian VP Announces Long-Term Plan to Construct Nuclear Power Plants
- 2003 (MAY) U.S. Announces Establishment of Proliferation Security Initiative (PSI)
- 2004 (OCT) Iran Tests Improved Version of Shahab-3 MRBM (Ghadr-1)
- 2005 (SEP) IAEA Finds Iran to be in Noncompliance with NPT Safeguards Agreement
- 2005 (SEP) NATO Establishes ALTBMD Program for Theater Missile Defense (TMD)
- 2006 (FEB) IAEA Board of Governors Refers Iranian Nuclear Issue to the UNSC
- 2006 (JUL) UNSCR 1696 Demands Iran Comply with IAEA

2006 (JUL) North Korea Launches Taepodong 2 (4-Cluster No-Dong Design; Failed)

2006 (DEC) UNSCR 1737, Imposes Sanctions Persons/Entities Involved in Proliferation

2007 (JAN) U.S. Formal Negotiations Start with Poland/Czech Republic on Missile Defense

2007 (MAR) UNSCR 1747, 2<sup>nd</sup> Round of Sanctions against Iran

2007 (JUN) Russia Offers to Partner with U.S. on Missile Defense at Azerbaijan Site

2007 (JUL) Russia Announces Suspension of Conventional Forces in Europe (CFE) Pact

2007 (SEP) Israeli Air Force Attacks Suspected Nuclear Facility in Syria

2008 (MAR) UNSCR 1803, 3<sup>rd</sup> Round of Sanctions against Iran

2008 (JUL) U.S., Czech Republic Sign Missile Defense Agreement (not ratified)

2008 (AUG) Armed Conflict between Russia and Georgia Over South Ossetia and Abkhazia

2008 (AUG) U.S., Poland Sign Missile Defense Agreement (not ratified)

2008 (AUG) Iran Launches Safir Space Launch Vehicle (SLV) with Dummy Satellite

2008 (SEP) UNSCR 1835, Takes Note of E3+3 Dual-Track Approach to Iran Nuclear Issue

2008 (NOV) Russian President Medvedev Announces Plan to Deploy Missiles to Kaliningrad

2008 (NOV) Iran Conducts Test Flight of New (Sajjil-2) Multi-Staged Solid-Fuel MRBM

2009 (FEB) Iran Launches Safir-2 SLV to Place Omid Satellite into Orbit

2009 (APR) North Korea Launches Three-Stage Unha-2 (4-Cluster No-Dong Design)

2009 (SEP) White House Announces PAA for Missile Defense in Europe

2009 (SEP) President Medvedev Calls off Decision to Deploy Missiles to Kaliningrad

2009 (SEP) Iran Informs IAEA of Uranium Enrichment Facility near Qom

2009 (DEC) Iran Launches Sejil-2 Medium-Range Ballistic Missile Test

2010 (FEB) Iran Unveils Mock-Up of Simorgh (4-Cluster No-Dong Design) Launch Vehicle

2010 (MAY) Iran, Turkey, Brazil Sign Agreement for Iran to Ship Uranium to Turkey

- 2010 (MAY) U.S. Deploys Patriot Missile Battery to Poland
- 2010 (JUN) UNSCR 1929, 4<sup>th</sup> Round of Sanctions against Iran
- 2010 (JUN) NATO Opens Expanded Theater Missile Defense Test Facility in the Netherlands
- 2010 (JUL) President Obama Signs Iran Sanctions Act Imposing Sanctions on Tehran
- 2010 (JUL) European Union (EU) Adopts Sanctions against Iran

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# CHAPTER 1

## INTRODUCTION

The most probable threats to Allies in the coming decade are unconventional. Three in particular stand out: 1) an attack by ballistic missile (whether or not nuclear-armed); 2) strikes by international terrorists groups; and 3) cyber assaults of varying degrees of severity.<sup>1</sup>

Group of Experts' Recommendations for New NATO Strategic Concept, May 2010

### Background

Iran's position in the Middle East is unique. Iran is a Persian country surrounded by Arabs and other non-Persian ethnic groups.<sup>2</sup> Iran is a Shia Muslim country surrounded by mostly Sunni Muslims and some Christians. It sees the presence of Western militaries in neighboring countries such as Iraq and Afghanistan, and also sees Israel's significant military capabilities. As such, Iran perceives an existential threat. Feeling threatened, Iran continues to develop offensive and defensive military capabilities including long-range ballistic missiles, proxy groups, and probably views a nuclear-armed ballistic missile as a credible deterrent against an external attack.

As demonstrated during the Iran-Iraq War and the Persian Gulf War, Iranian government and military leaders also view ballistic missiles as an asymmetric capability that can project power beyond its borders and can compensate for potentially overmatched Iranian conventional forces. Meanwhile, for many Iranians, Iran's nuclear program is a sovereign right and a source of national pride.<sup>3</sup> While Iran claims its

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<sup>1</sup> North Atlantic Treaty Organization (NATO), NATO 2020: Assured Security; Dynamic Engagement, Analysis and Recommendations of the Group of Experts on a New Strategic Concept for NATO, May 17, 2010, [http://www.nato.int/cps/en/natolive/official\\_texts\\_63654.htm](http://www.nato.int/cps/en/natolive/official_texts_63654.htm), 17.

<sup>2</sup> CIA World Factbook, <https://www.cia.gov/library/publications/the-world-factbook/geos/ir.html>; While a Persian majority, Iran also has several minority ethnic groups (e.g., Azeri, Kurd, Turkman, etc.).

<sup>3</sup> Jerrold D. Green, Federic Wehrey, and Charles Wolf Jr., "Understanding Iran," RAND Corporation,



ballistic missiles are defensive in nature and its nuclear program is for peaceful purposes, Iran's missile development and nuclear weapons development efforts and lack of transparency leave those claims open to serious debate.<sup>4</sup>

The threats posed by Iranian ballistic missiles and the nexus of Iran's ballistic missile and nuclear weapons programs are of great concern to the U.S., NATO, and the international community. A nuclear armed Iran with a ballistic missile capable of delivering a nuclear weapon would significantly threaten regional and international security, the prospects of which have resulted in a security dilemma for Iran's neighbors and the international community.

To mitigate the threat, the international community has gone to great lengths to engage Iran diplomatically. Given Iran's military capabilities and ambiguous intent, the U.S. has taken steps, to defend itself and Allies against a possible Iranian attack, and to be in a position to respond from a position of strength militarily. NATO is considering how to respond to the threat. Hence, the U.S., NATO members and Middle Eastern countries have engaged in threat mitigation efforts such as non-proliferation initiatives, economic sanctions and missile defense deployments.

At the Lisbon Summit in November 2010, NATO will consider the Iranian ballistic missile threat and decide whether to make missile defense a NATO mission. Two recent developments have helped to set the stage for NATO's missile defense discussions: the NATO Group of Expert's May 2010 recommendations for a new NATO Strategic Concept and President Barack Obama's September 2009 announcement of the new U.S. approach for missile defense in Europe.

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January 8, 2009.

<sup>4</sup> Robin Pomeroy, "Iran Denies U.S. Assertion Its Missiles Menace Europe," *Reuters*, June 19, 2010, <http://www.reuters.com/article/idUSTRE65I0Z420100619>.

At the April 2009 NATO Summit in Strasbourg/Kehl, Alliance leaders directed the Secretary General to convene a Group of Experts to lay the foundation for a new NATO Strategic Concept. In May 2010, the Group of Experts presented their findings and concluded that while the prospect of direct military attack across the borders of the Alliance is slight, there remains a host of unconventional and less predictable threats to Alliance members including: acts of terrorism; the proliferation of nuclear and other advanced weapons technologies; cyber attacks directed against modern communications systems; the sabotage of energy pipelines; and the disruption of critical maritime supply routes.<sup>5</sup> The Group of Experts identified three specific threats as the most probable threats to the Allies in the coming decade: ballistic missile attack, terrorist attack and cyber attack.<sup>6</sup> The Group's report characterized Iran's ballistic missile threat and nuclear weapons program as a potential Article 5 threat to the Alliance.<sup>7</sup>

From the U.S. perspective, there are serious concerns about Iran and its ballistic missile program. In September 2009, President Barack Obama announced a new U.S. missile defense policy for Europe called the Phased Adaptive Approach (PAA); also referred to as the European-based PAA (EPAA). The new U.S. approach is largely based upon the assessment that the threat posed by Iran's ballistic missile capability is growing.<sup>8</sup> To counter the perceived threat, the PAA calls for the deployment of U.S. missile defense systems -- including command and control, sensors and interceptor weapons system -- to Europe in four phases between 2011 and 2020.

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<sup>5</sup> NATO, NATO 2020: Assured Security; Dynamic Engagement, 7.

<sup>6</sup> Ibid, 4.

<sup>7</sup> Ibid, 16.

<sup>8</sup> The White House, Fact Sheet on U.S. Missile Defense Policy A 'Phased, Adaptive Approach' for Missile Defense in Europe, September 17, 2009, [http://www.whitehouse.gov/the\\_press\\_office/FACT-SHEET-US-Missile-Defense-Policy-A-Phased-Adaptive-Approach-for-Missile-Defense-in-Europe/](http://www.whitehouse.gov/the_press_office/FACT-SHEET-US-Missile-Defense-Policy-A-Phased-Adaptive-Approach-for-Missile-Defense-in-Europe/).

## Research Purpose, Organization and Research Questions

The purpose of this advanced research project is to analyze the threat posed by Iran's ballistic missile program and to analyze U.S. and NATO missile defense plans for Europe. The primary research question this paper seeks to answer is: Are U.S. and NATO missile defense plans for Europe sufficient to defend against a ballistic missile attack from Iran for the foreseeable future?

Chapter 2, "The Nature of the Threat," and Chapter 3, "Missile Defense Policies and Capabilities," present information from multiple perspectives on the Iranian ballistic missile threat and NATO and U.S. missile defense plans to answer the research questions. The information presented includes the perspectives of: the United Nations (UN) and the International Atomic Energy Agency (IAEA); NATO; the U.S., selected NATO members; selected Middle Eastern countries; Russia; and research centers and non-governmental organizations (NGOs) such as the Congressional Research Service (CRS), the Heritage Foundation, the Center for Strategic and International Studies (CSIS) and the International Institute for Strategic Studies (IISS).<sup>9</sup>

There are ten secondary research questions used to guide the research; five are related to the Iranian ballistic missile threat and five are related to U.S. and NATO missile defense plans. The answers to these questions will provide the basis for answering the primary research question. The secondary research questions are:

- What is the nature of the Iranian ballistic missile threat?
- How likely is Iran's ICBM threat to evolve?
- To what degree are Allies agreed on the threat?

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<sup>9</sup> The information presented also includes general perspectives obtained during the author's meetings from September 7-10, 2010 with U.S. and NATO representatives at U.S. European Command (Stuttgart, Germany), U.S. Army Europe (Heidelberg, Germany), and NATO Headquarters (Brussels, Belgium).

- How do other countries in the Middle East perceive the Iranian threat?
- How does Russia perceive the Iranian threat?
- What are current NATO missile defense policies and capabilities?
- What are current U.S. missile defense policies and capabilities?
- What factors may inhibit a decision to make missile defense a NATO mission at the Lisbon Summit?
- What are the perspectives of research and non-governmental organizations toward U.S. missile defense plans for Europe?
- What is Russia's perspective on U.S. missile defense plans for Europe?

Chapter 4, "Scenarios," examines the information presented about the threat, Allies' missile defense plans, considers the Iranian threat more broadly, and presents several potential scenarios that could evolve in the future. Chapter 4 also assigns levels of probability and risk to each potential scenario.

Finally, Chapter 5 provides conclusions and recommendations for U.S. and NATO policymakers and planners considering missile defense and ways to effectively deal with the threat posed by Iran's ballistic missile program.

#### Definition of Key Terms

Ballistic Missile. After an initial powered phase of flight, a ballistic missile leaves the atmosphere (at an altitude of about 100 km) and follows an unpowered trajectory or flight path before reentering the atmosphere toward a predetermined target. Ballistic missile ranges vary from approximately 100 km to more than 10,000 km.<sup>10</sup>

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<sup>10</sup> Steven A. Hildreth., "Iran's Ballistic Missile Programs: An Overview," Congressional Research Service Report RS22758, February 4, 2009, 1.

Short-Range Ballistic Missile (SRBM). Range of less than 1,000 km (621 miles).<sup>11</sup>

Medium-Range Ballistic Missile (MRBM). Range of 1,000-3,000 km (621-1,864 miles).

Intermediate-Range Ballistic Missile (IRBM). Range of 3,000-5,500 km (1,864-3,418 miles).

Intercontinental Ballistic Missile (ICBM). Range of more than 5,500 km (3,418 miles).

Missile Defense. To defend territory against a ballistic missile attack.<sup>12</sup>

Theater Missile Defense (TMD). To protect deployed forces against a ballistic missile attack.

### Scope and Limitations

The scope of this advanced research project is limited in several ways. First, this paper is unclassified and has been drafted using only open source information. Second, while this paper focuses on the Iranian ballistic missile threat, it also addresses the prospect of an Iranian nuclear weapon capability since it is the combination of Iran's ballistic missile and nuclear weapons programs that represents the most dangerous threat to regional and international security. Third, this paper focuses on U.S. missile defense capabilities in Europe (as opposed to worldwide U.S. capabilities). It does, however, make limited reference to U.S. missile defense capabilities in the Middle East particularly where those capabilities, such as early warning radar, are relevant to missile defense in Europe. Fourth, the phrase "foreseeable future" as used in the primary research question looks out to the 2015-2020 timeframe, a timeframe also used in other missile defense

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<sup>11</sup> National Air and Space Intelligence Center, "Ballistic and Cruise Missile Threat," April 2009, p. 7 (same source used for all range-related key terms).

<sup>12</sup> The Library of Congress, S.269 -- National Missile Defense Act of 1999, January 22, 1999, <http://thomas.loc.gov/cgi-bin/query/z?c106:S.269:>.

planning documents. Finally, this paper standardizes spelling for consistency but does not change spelling used in quotations.

## CHAPTER 2

### THE NATURE OF THE THREAT

We judge Iran would likely choose missile delivery as its preferred method of delivering a nuclear weapon. Iran already has the largest inventory of ballistic missiles in the Middle East and it continues to expand the scale, reach and sophistication of its ballistic missile forces -- many of which are inherently capable of carrying a nuclear payload.<sup>13</sup>

Director of National Intelligence Blair, Statement for the Record, February 2, 2010

#### Introduction

The threat of Iran's ballistic missile program coupled with its nuclear weapons program has been the subject of much concern and debate in recent years. Internationally, Iran's ballistic missile and nuclear programs have been under scrutiny at the UN, and investigated by the IAEA, resulting in multiple UN Security Council (UNSC) resolutions. Regionally, the perceived Iranian threat has also generated a significant amount of diplomatic activity and has resulted in the deployment of U.S. and Allied missile defense systems throughout Europe and the Middle East. This chapter presents information and views from multiple perspectives on the nature of the Iranian ballistic missile threat. The perspectives considered include: the UN, the IAEA, NATO as well as selected individual NATO members, the U.S., various research centers and NGOs, selected Middle Eastern countries, and Russia. Taken together, the information should provide a more holistic appreciation for the nature of the threat posed by Iran's ballistic missile capability.

#### Nuclear Non-Proliferation

At the international level, while the UN is concerned about both Iran's nuclear and ballistic missile technology proliferation, it has placed greater emphasis on ensuring

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<sup>13</sup> Dennis C. Blair, Director of National Intelligence (DNI), Annual Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, February 2, 2010, 13.

Iran fulfills its nuclear-related international obligations. Therefore, UN and IAEA documents, and the statements of these organization's leaders have focused more on the nuclear aspects of the Iranian threat than on the ballistic missile threat.

The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) is the international treaty aimed at preventing the spread of nuclear weapons and weapons technology. A total of 190 parties have joined the treaty; Iran ratified the NPT in 1970.<sup>14</sup> Under Article III of the NPT, parties to the treaty are required to accept a Safeguards Agreement with the IAEA, which Iran did in 1974, in order to verify each state's fulfillment of its treaty obligations and to prevent "diversion of nuclear energy from peaceful uses to nuclear weapons or other nuclear explosive devices."<sup>15</sup> Furthermore, Article 8 of Iran's Safeguards Agreement with the IAEA states that Iran will "provide the Agency with information concerning nuclear material subject to safeguards under this Agreement and the features of facilities relevant to safeguarding such material."<sup>16</sup>

In 2002, two developments caused the IAEA to begin investigating Iran's nuclear activities. First, in August 2002, an Iranian exile group called the National Council of Resistance on Iran (NCRI) announced that Iran had built a secret underground nuclear-related facility in Natanz but had not revealed the site's existence to the IAEA. Second, in September 2002 at the IAEA's General Conference in Vienna, Iran's Vice President and President of the Atomic Energy Organization of Iran (AEOI), Reza Aghazadeh stated that, "Iran is embarking on a long-term plan, based on the merits of energy mix, to

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14 The United Nations, Office of Disarmament Affairs, Status of Treaty on the Non-Proliferation of Nuclear Weapons, <http://disarmament.un.org/TreatyStatus.nsf>.

15 The United Nations, Office of Disarmament Affairs, Treaty on the Non-Proliferation of Nuclear Weapons (NPT), <http://www.un.org/disarmament/WMD/Nuclear/NTP.shtml>.

16 International Atomic Energy Agency (IAEA), Information Circular 214, December 13, 1974, 3.



construct nuclear power plants with a total capacity of 6,000 megawatts (MW) within two decades.”<sup>17</sup>

During the ensuing three-year investigation, the IAEA found that Iran had not complied with its NPT Safeguards Agreement and the IAEA Board of Governors referred the matter to the UNSC in February 2006. The excerpt below from the IAEA Board of Governors Resolution highlights the IAEA’s findings in 2006.

Recalling Iran’s many failures and breaches of its obligations to comply with its NPT Safeguards Agreement and the absence of confidence that Iran’s nuclear programme is exclusively for peaceful purposes resulting from the history of concealment of Iran’s nuclear activities, the nature of those activities and other issues arising from the Agency’s verification of declarations made by Iran since September 2002.<sup>18</sup>

Since 2006, the UNSC has passed six resolutions (1696 in July 2006, 1737 in December 2006, 1747 in March 2007, 1803 in March 2008, 1835 in September 2008, and 1929 in June 2010) calling on Iran to suspend nuclear enrichment and reprocessing activities and to cooperate fully with the IAEA. Additionally, four of these UNSC resolutions (1737, 1477, 1803 and 1929) levy sanctions upon a number of individuals and entities involved in Iranian nuclear or ballistic missile activities. In spite of the UNSC resolutions and the IAEA’s efforts, to date the IAEA has been unable to conclude that Iran’s nuclear programs are exclusively for peaceful purposes.<sup>19</sup> Iran’s continued unwillingness to abide by UNSC resolutions was underscored in September 2009 when the U.S., United Kingdom and France presented information to the IAEA, which showed

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<sup>17</sup> Reza Aghazadeh, Vice President of the Islamic Republic of Iran and President of the Atomic Energy Organization of Iran at the 46<sup>th</sup> General Conference of the IAEA, Vienna, September 16, 2002, 3.

<sup>18</sup> IAEA Board of Governors’ Resolution, Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran, February 4, 2006, 1.

<sup>19</sup> For more detailed information about Iran’s nuclear program and Tehran’s Compliance with international obligations, see Congressional Research Service Report R40094, by Paul K. Kerr, December 23, 2009.

that Iran had been building a secret uranium enrichment facility near Qom for several years.<sup>20</sup>

UN Secretary-General Ban Ki-Moon challenged the current state of affairs vis-à-vis Iran's nuclear program and its history of non-compliance with the UN and the IAEA in his address to the 2010 Review Conference of the States Parties to the Treaty on the Non-Proliferation of Nuclear Weapons.

With respect to the Iranian nuclear programme, I call on Iran to fully comply with Security Council resolutions and fully cooperate with the IAEA... And I encourage the President of Iran to engage constructively. Let us be clear: the onus is on Iran to clarify the doubts and concerns about its programme.<sup>21</sup>

In spite of multiple UNSC resolutions and increasing diplomatic pressure, the IAEA's May 2010 report articulates continued concern over Iran's nuclear and missile programs. The excerpt below from the IAEA report highlights the possible military dimensions of the Iranian threat.

Based on an overall analysis undertaken by the Agency of all the information available to it, the Agency remains concerned about the possible existence in Iran of past or current undisclosed nuclear related activities, involving military related organizations, including activities related to the development of a nuclear payload for a missile.<sup>22</sup>

### Preventing Proliferation of Missiles and Missile Technology

While the NPT governs nuclear proliferation, there is no equivalent legally binding international treaty aimed at preventing the proliferation of missiles and related technology. However, there are three multilateral instruments which seek to prevent

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<sup>20</sup> The White House, Statements by President Obama, French President Sarkozy, and British Prime Minister Brown on Iranian Nuclear Facility, September 25, 2009, [http://www.whitehouse.gov/the\\_press\\_office/Statements-By-President-Obama-French-President-Sarkozy-And-British-Prime-Minister-Brown-On-Iranian-Nuclear-Facility/](http://www.whitehouse.gov/the_press_office/Statements-By-President-Obama-French-President-Sarkozy-And-British-Prime-Minister-Brown-On-Iranian-Nuclear-Facility/).

<sup>21</sup> Ki-Moon, Ban, UN Secretary-General, Address to the 2010 Review Conference of the States Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, May 3, 2010.

<sup>22</sup> IAEA Board of Governors, Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions 1737 (2006), 1747 (2007), 1803 (2008) and 1835 (2008) in the Islamic Republic of Iran, May 31, 2010, 8.

missile proliferation. They are the Hague Code of Conduct (HCOC) against Ballistic Missile Proliferation, the Missile Technology Control Regime (MTCR) and the U.S.-led Proliferation Security Initiative (PSI). The HCOC entered into force in 2002 and has 130 countries as signatory members.<sup>23</sup> The MTCR was established in 1987 with 34 countries participating.<sup>24</sup> In 2003, the U.S. also established the multilateral PSI program, which is aimed at stopping the trafficking of weapons of mass destruction (WMD), their delivery systems, and related materials to and from states and non-state actors of proliferation concern. As of June 2010, the PSI had 97 countries as participants.<sup>25</sup> Iran is not a member of the HCOC, MTCR or PSI and therefore is not legally bound by the tenets of these agreements. However, these nonproliferation instruments create important barriers to Iran's ballistic missile development and should be continued if not strengthened.

#### NATO Perspective

A review of NATO documents and the statements by senior NATO officials indicate that, despite some differences among member states, NATO generally views Iran's ballistic missile program as a significant and growing threat.

The April 2009 NATO Summit Declaration issued by the Heads of State and Government is representative of other NATO official documents about how the Alliance views the threat. The Declaration states, "Ballistic missile proliferation poses an increasing threat to Allies' forces, territory, and populations."<sup>26</sup> With specific regard to the threat from Iran, the declaration later read, "We remain deeply concerned about the

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<sup>23</sup> The Hague Code of Conduct against Ballistic Missile Proliferation (HCOC), <http://www.bmeia.gv.at/en/foreign-ministry/foreign-policy/disarmament/weapons-of-mass-destruction/hcoc.html>.

<sup>24</sup> The Missile Technology Control Regime (MTCR), <http://www.mtc.info/english/index.html>.

<sup>25</sup> U.S. Department of State, Proliferation Security Initiative, <http://www.state.gov/t/isn/c10390.htm>.

<sup>26</sup> NATO, Strasbourg/Kehl Summit Declaration, April 4, 2009, [http://www.nato.int/cps/en/natolive/news\\_52837.htm](http://www.nato.int/cps/en/natolive/news_52837.htm), para. 50.

Iranian nuclear and ballistic missile programmes, and related proliferation risks and call on Iran to comply with relevant UNSCRs.”<sup>27</sup>

While the conclusions and recommendations of the Experts’ Group are not NATO-agreed language, they closely track with views previously expressed by the Alliance. As already noted, the May 2010 NATO Group of Experts’ report stated that, “Defending against the threat of a possible ballistic missile attack from Iran has given birth to what has become, for NATO, an essential military mission.”<sup>28</sup> The report’s strongly worded assessment further characterized the threat posed by the confluence of Iran’s nuclear and ballistic missile programs in Article 5 terms saying, “Iran’s efforts to enrich nuclear fuel, develop nuclear weapons designs, and stockpile long-range ballistic missiles could create a major Article 5 threat to the Alliance in this decade.”<sup>29</sup>

In a speech in May 2010 at Bucharest University, NATO Secretary General Anders Fogh Rasmussen echoed the sentiments of both the Group of Experts’ report and the April 2009 NATO Summit Declaration when he spoke to both the policy aspects of the Iranian threat and to some of the technical aspects of Iran’s ballistic missile capability and how it threatens Alliance members directly.

A look at current trends shows that the proliferation threat is real and growing -- over 30 countries have or are developing missile capabilities, with greater and greater ranges. In many cases, these missiles could eventually threaten our populations and territories. And several countries are seeking nuclear weapons. This is a deadly combination.

Iran is a case in point. Tehran is pursuing its nuclear activities in defiance of several UN Security Council resolutions. And in parallel with these nuclear programmes, Iran also runs an extensive missile development programme. Statements from Iranian officials declare the range of their Shahab-3 missiles to

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<sup>27</sup> Ibid, para. 56.

<sup>28</sup> NATO, NATO 2020: Assured Security; Dynamic Engagement, 11.

<sup>29</sup> Ibid, 16.

be 2,000 kilometres. That will already put Allied countries within reach: Turkey, Greece, Bulgaria and Romania.<sup>30</sup>

### NATO Members: Poland, Czech Republic, Estonia and Turkey

Despite widespread agreement among Allies on the threat, there are some differences in the way in which individual NATO countries and public opinion within Allied countries perceive the Iranian ballistic missile threat. Among NATO members, Turkey, which borders Iran, and states of Eastern Europe and the Baltic Region seem to differ from NATO the most on how they view the threat. In particular, the perceptions in Poland, the Czech Republic, Estonia and Turkey offer insights into differences in how NATO Allies view the Iranian missile threat. While it is important to discriminate between the perceptions of the government's views and the views of the public at large, public opinion within Allied countries is important because of the impact that it can have on how these issues are dealt with at the national and NATO-levels.

In the Czech Republic and Poland, two countries with significant roles in U.S. missile defense plans for Europe, public opinion polls consistently indicate that populations in both countries are opposed to the presence of missile defense assets. This is, in part, due to a lack of a perceived threat from Iran. In Poland, rather than a sense of danger from Iranian ballistic missiles, opinion surveys indicate greater concern over issues of sovereignty and of harming relations with Russia.<sup>31</sup> Supporting the argument that Poland does not view Iran as overly threatening, a 2009 U.S. Congress House Armed Services Committee staff report stated that Poland's government's prime objective in supporting U.S. missile defense was to improve overall strategic cooperation with the

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<sup>30</sup> Anders Fogh Rasmussen, NATO Secretary-General Speech at the Bucharest University, May 7, 2010, [http://www.nato.int/cps/en/natolive/opinions\\_63307.htm](http://www.nato.int/cps/en/natolive/opinions_63307.htm).

<sup>31</sup> Steven A. Hildreth, "Long-Range Ballistic Missile Defense in Europe," Congressional Research Service RL34051, April 26, 2010, 12.

U.S.<sup>32</sup>

In the Czech Republic, between 60-70 percent of those surveyed opposed the construction of a radar facility within its borders.<sup>33</sup> Rather than protecting them from the threat posed by Iran, critics of U.S. missile defense plans have argued that stationing missile defense infrastructure on Czech soil would actually increase the threat. Many fear provoking Russia or that the Czech Republic will become a target for Iranian missiles. Still, there remains a divide between the views of the Czech public and the country's political elite on the issue of the threat and whether to support U.S. missile defense initiatives. As recently as July 2010, in spite of public opinion, Czech Prime Minister Petr Necas said the Czech Republic is prepared to host a U.S.-funded missile defense early warning radar and that he assumes the system will become part of a NATO missile defense system.<sup>34</sup>

However, Russian actions could result in increased support, both in the public and among government leaders in Poland and the Czech Republic, for closer cooperation with the U.S. and NATO. Russia's August 2008 military action in Georgia and Russia's November 2008 threat to deploy missiles to Kaliningrad (which borders Poland and Lithuania) may have increased support in Poland for missile defense, according to polling data.<sup>35</sup> Additionally, a 2009 Russian exercise involving approximately 13,000 Russian and Belarusian troops highlighted the potential Russian threat to Poland and provoked public outrage in Poland when Russian troops simulated a nuclear attack and an air and

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<sup>32</sup> U.S. House Armed Services Committee, Staff Report, Missile Defense Fact Sheet, H.R. 2647, the FY10 NDAA, June 16, 2009.

<sup>33</sup> Eben Harrel and Katerina Zachovalova, "Mixed Reactions in Europe to the U.S. Missile Defense U-Turn," *Time*, September 17, 2009, <http://www.time.com/time/world/article/0,8599,1924530,00.html>.

<sup>34</sup> "Czech Republic Ready to Host U.S. Missile Warning Centre: PM," *Agence France-Presse*, July 31, 2010.

<sup>35</sup> Nicholas Kulish, "With Russia Rising, Poles Look West," *International Herald Tribune*, August 21, 2008, 1.

sea attack on Poland.<sup>36</sup>

As a relatively new NATO member and a former Soviet republic, Estonia's threat perception also highlights the extent to which Allies view the threat differently. In its May 2010 National Security Concept, Estonia addresses a number of threats to its security environment including terrorism, cyber crime, organized crime, and the disruption of energy supplies.<sup>37</sup> However, its Security Concept makes no mention of Iran or of ballistic missiles. Rather, it mentions Russia 13 times suggesting concerns over potential external efforts by Russia to coerce or exert pressure against Estonia. At an April 2010 informal NATO Foreign Minister's meeting in Tallinn, Estonia, the issue of threat perceptions was discussed, and while NATO Secretary-General Rasmussen raised the issue of missile defense and its importance to protect Europe from threats emanating from rogue states such as Iran, press reports stated that Estonia was "quietly lobbying NATO to recognize in its new strategic concept that Russia remains a threat."<sup>38</sup> Further indicating a perceived threat from Russia rather than from Iran, Estonian Foreign Minister Paet said at the April 2010 NATO Summit "that Estonia and other Eastern European allies are keen for NATO to take a more 'realistic' stance on Russia that reflects Moscow's own aggressive posture."<sup>39</sup>

Finally, Turkey's threat perception of Iran's nuclear and missile programs is very different from the perception contained in official NATO documents and from the

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<sup>36</sup> Matthew Day, "Russia Simulates Nuclear Attack on Poland," *The Daily Telegraph* (UK), November 1, 2009, <http://www.telegraph.co.uk/news/worldnews/europe/poland/6480227/Russia-simulates-nuclear-attack-on-Poland.html>.

<sup>37</sup> National Security Concept of Estonia, May 12, 2010, <http://www.vm.ee/?q=en/taxonomy/term/57>.

<sup>38</sup> Ahto Lobjakas, "In Tallinn, NATO Ministers Search for Solidarity," *Radio Free Europe Radio Liberty*, April 22, 2010, [http://www.rferl.org/content/In\\_Tallinn\\_NATO\\_Ministers\\_Search\\_For\\_Solidarity/2021600.html](http://www.rferl.org/content/In_Tallinn_NATO_Ministers_Search_For_Solidarity/2021600.html).

<sup>39</sup> Ahto Lobjakas, "NATO Looks to Evolve without Shredding DNA," *Radio Free Europe Radio Liberty*, April 23, 2010, [http://www.rferl.org/content/NATO\\_Looks\\_To\\_Evolve\\_Without\\_Shedding\\_DNA/2022032.html](http://www.rferl.org/content/NATO_Looks_To_Evolve_Without_Shedding_DNA/2022032.html).

perception held by the majority of the NATO Allies. Although Turkey agreed to the NATO documents already referred to, they have quite different views on the relationship to Iran to which they aspire. Again, a review of official documents and the statements of Turkish leaders reflect that Turkey views Iran more as partner to be engaged with constructively than as a threat. Three recent developments provide insight into Turkey's overarching perception of Iran and reflect that Turkey does not view Iran's ballistic missile program as a threat.

First, in May 2010, Turkey, working with Brazil, signed an agreement with Iran whereby Iran could ship 1,200 kilograms (kg) of low-enriched uranium to Turkey for safekeeping in exchange for fuel rods enriched to a higher level of 20 percent, for use in a medical research reactor.<sup>40</sup> Further indicating a split with NATO Allies on Iran's nuclear program, during the agreement's announcement, Turkey's and Brazil's Foreign Ministers condemned any new sanctions against Iran and said Iran has a right to a "full nuclear fuel cycle, including enrichment."<sup>41</sup>

Second, Turkish Prime Minister Recep Tayyip Erdogan has argued that Iran's nuclear program is for peaceful purposes saying, "Iran does not accept it is building a weapon. They are working on nuclear power for the purposes of energy only."<sup>42</sup>

Further, when the fourth round of UNSC sanctions against Iran was introduced in June 2010, Turkey, a non-permanent Security Council member, voted against the measure.

However, Turkey has said it will enforce UNSC sanctions against Iran.

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<sup>40</sup> Marc Champion and Joe Parkinson, "Iran Says It Is Ready for Talks on Nuclear Fuel-Swap," *The Wall Street Journal*, July 26, 2010, [http://online.wsj.com/article/NA\\_WSJ\\_PUB:SB40001424052748703995104575388653340954196.html](http://online.wsj.com/article/NA_WSJ_PUB:SB40001424052748703995104575388653340954196.html), 11.

<sup>41</sup> Thomas Erdbrink, "Iran to Ship Uranium to Turkey in Nuclear Deal," *The Washington Post*, May 17, 2010, <http://www.washingtonpost.com/wp-dyn/content/article/2010/05/17/AR2010051700105.htm>.

<sup>42</sup> Robert Tait, "Iran is Our Friend says Turkish PM Recep Tayyip Erdogan," *The Guardian* (UK), October 26, 2009, <http://www.guardian.co.uk/world/2009/oct/26/turkey-iran1>.



Third, Turkey has significant economic and energy ties with Iran, a trend that runs counter to that of other NATO Allies. According to a February 2010 Brookings Institution report, “The total trade volume between the two countries is \$10 billion and expected to double in the next three years -- given Turkey’s growing need for natural gas and willingness to lessen its dependence on Russia. As a result, Turkey will resist Western efforts to tighten economic sanctions against Tehran.”<sup>43</sup>

While the aforementioned examples indicate that Turkey does not view Iran or Iran’s ballistic missile program as threatening, as it relates to the Alliance’s missile defense plans, Turkey has given no indication that it will resist efforts to make missile defense a NATO mission at NATO’s November 2010 summit.

#### U.S.: Statements by Government Leaders

President Obama’s remarks and statements by other senior U.S. government officials reflect how the U.S. perceives the threat from Iran’s ballistic missiles. In addition, a review which follows of official U.S. government documents including the U.S. Intelligence Community’s 2010 Annual Threat Assessment, the Department of Defense’s 2010 Ballistic Missile Defense Review (BMDR) Report, and the National Air and Space Intelligence Center (NASIC) 2009 Ballistic and Cruise Missile Threat report provides detail on how the U.S. views the nature of the Iranian ballistic missile threat.

In September 2009, when President Obama announced plans to strengthen U.S. missile defense in Europe, he spoke about the threat posed by Iranian ballistic missiles. He said, “First, we have updated our intelligence assessment of Iran’s missile programs, which emphasizes the threat posed by Iran’s short- and medium- range missiles, which

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<sup>43</sup> Omer Taspinar, “Iran and Turkish-American Relations,” Brookings Institution, February 10, 2010, [http://www.brookings.edu/opinions/2010/0201\\_turkey\\_iran\\_taspinar.aspx](http://www.brookings.edu/opinions/2010/0201_turkey_iran_taspinar.aspx).

are capable of reaching Europe.”<sup>44</sup>

Also in September 2009, following the President’s announcement of the new approach to missile defense, Secretary of Defense Robert Gates addressed the threat in a Department of Defense news briefing. He reiterated that the more immediate threat was from Iran’s short- and medium-range ballistic missiles and said those programs were developing more rapidly than previously thought. He specifically named the Shahab-3 missile as an example. Further, Secretary Gates stated that, based on the latest intelligence, the threat from Iran’s ICBMs had developed more slowly than was previously estimated by the intelligence community (IC).<sup>45</sup>

In an October 2009 speech to NATO Defense Ministers, the U.S. Ambassador to NATO, Ivo Daalder, echoed President Obama’s and Secretary Gates’ remarks on the Iranian short- and medium- range missile threat and also addressed U.S. concerns about Iran’s longer-range missiles and its nuclear program. Ambassador Daalder stated, “We now know that Iran already has hundreds of ballistic missiles that can threaten its neighbors, and it is actively developing and testing ballistic missiles that can strike farther into Europe. We also know that Iran is -- at a minimum -- keeping the option of developing nuclear weapons, as well as longer-range delivery systems.”<sup>46</sup>

In June 2010, Central Intelligence Agency (CIA) Director, Leon Panetta, spoke about the Iranian threat saying that if Iran made the decision to make a nuclear weapon, he estimated it would take about a year for Iran to make a bomb and then another year to

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<sup>44</sup> The White House, Remarks by the President on Strengthening Missile Defense in Europe, September 17, 2009, [http://www.whitehouse.gov/the\\_press\\_office/Remarks-by-the-President-on-Strengthening-Missile-Defense-in-Europe/](http://www.whitehouse.gov/the_press_office/Remarks-by-the-President-on-Strengthening-Missile-Defense-in-Europe/).

<sup>45</sup> U.S. Department of Defense, DoD News Briefing with Secretary Gates and Gen. Cartwright, September 17, 2009, <http://www.defense.gov/transcripts/transcript.aspx?transcriptid=4479>.

<sup>46</sup> Ivo Daalder, “New Nuclear Disarmament Proposals: Implications for NATO and Transatlantic Relations,” U.S. Mission to NATO: Defense Ministers Meeting in Bratislava, Ambassador Daalder’s Speech, October 23, 2009, <http://nato.usmission.gov/Texts/Daalder10222009.asp>.

develop a weapon delivery system (presumably a ballistic missile capable of carrying a nuclear warhead). When asked about Iranian nuclear weapons and “weaponization” during an ABC News interview, he said,

I think they [Iran] continue to work on designs in that area. There is a continuing debate right now as to whether or not they ought to proceed with a bomb. But they clearly are developing their nuclear capability and that raises concerns. It raises concerns about just exactly what are their intentions, and where they intend to go. And we think they have enough low-enriched uranium right now for two weapons. They do have to enrich it fully in order to get there. And we would estimate that if they made that decision, it probably would take a year to get there; probably another year to develop the kind of weapon delivery system in order to make that viable.<sup>47</sup>

Statements by two U.S. military leaders provide additional insights into the threat posed specifically by Iran’s ICBM program. In March 2009, then-director of the Defense Intelligence Agency (DIA), Lieutenant General Michael Maples, told the Senate Armed Services Committee, “Iran’s 2 February 2009 launch of the Safir Space Launch Vehicle shows progress in some technologies relevant to ICBMs.”<sup>48</sup> Also in March 2009, then-commander of U.S. European Command (EUCOM), General Bantz Craddock, testified before the Senate Armed Services Committee saying, “By 2015 Iran may also deploy an ICBM capable of reaching all of Europe and parts of the U.S.”<sup>49</sup>

#### Director of National Intelligence: 2010 Annual Threat Assessment

In February 2010, the Director of National Intelligence (DNI), Dennis C. Blair, along with other leaders from the intelligence community, presented the U.S. IC’s 2010 Annual Threat Assessment to the Senate Select Committee on Intelligence. In both his written statement and remarks to the committee, Director Blair discussed Iranian nuclear

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<sup>47</sup> Leon Panetta, Interview with CIA Director on This Week on ABC, Program Transcript, June 27, 2010.

<sup>48</sup> Lieutenant General Michael D. Maples, Director Defense Intelligence Agency (DIA), Annual Threat Assessment, Statement before the Senate Armed Services Committee, March 10, 2009.

<sup>49</sup> General Bantz J. Craddock, Commander, U.S. European Command (EUCOM), Statement before the Senate Armed Services Committee, March 24, 2009.

and ballistic missile programs. Regarding Iran's nuclear program, he stated that Iran continues to flout UNSC restrictions on its nuclear program, the risk is that Iran's nuclear program will cause other countries in the Middle East to take up nuclear options of their own, and the IC does not know if Iran will decide to build nuclear weapons. An excerpt of his statement follows:

We continue to assess Iran is keeping open the option to develop nuclear weapons in part by developing various nuclear capabilities that bring it closer to being able to produce such weapons, should it choose to do so. We do not know, however, if Iran will eventually decide to build nuclear weapons.<sup>50</sup>

Addressing the ballistic missile threat, Director Blair said that Iran continues to improve its ballistic missile force, which enhances power projection and provides a delivery means for a possible nuclear weapon.<sup>51</sup> The IC Statement for the Record submitted by Director Blair provides additional details on Iran's missile inventory.

We judge that Iran would likely choose missile delivery as its preferred method of delivering a nuclear weapon. Iran already has the largest inventory of ballistic missiles in the Middle East and it continues to expand the scale, reach and sophistication of its ballistic missile forces -- many of which are inherently capable of carrying a nuclear payload.<sup>52</sup>

#### Department of Defense: Ballistic Missile Defense Review

From March 2009 through January 2010, the Department of Defense conducted the first-ever Ballistic Missile Defense Review (BMDR). The congressionally mandated review considered U.S. policies, plans and programs, and begins with an overview of the ballistic missile threat to the U.S. and its allies.<sup>53</sup> The BMDR asserts that Iran's ballistic missile program presents both a regional threat and a potential threat to the U.S.

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<sup>50</sup> Blair, Annual Threat Assessment of the Intelligence Community, 13.

<sup>51</sup> Dennis C. Blair, Director of National Intelligence, Hearing of the Senate Select Committee on Intelligence, Current and Projected Threats to the United States, February 2, 2010.

<sup>52</sup> Blair, Annual Threat Assessment of the Intelligence Community, 13.

<sup>53</sup> U.S. Department of Defense, 2010 Ballistic Missile Defense Review Report Fact Sheet, 1.

homeland.

According to the BMDR, Iran is developing and testing missiles with the capability to reach Europe. Short- and medium-range missiles in Iran's inventory include the Shahab-1 (300 km range), Shahab-2 (500 km), Shahab-3 (1,300 km), the new solid-propellant MRBM (2,000 km) and the Shahab-3 variant (2,000 km). The ranges given are estimates and are, in part, based upon the statements of Iranian officials. If these range estimates are accurate, the Shahab-3 missile could travel as far as Turkey; the solid-propellant MRBM and Shahab-3 variant could travel as far as Greece, Bulgaria and Romania in southeastern Europe.<sup>54</sup> An excerpt from the BMDR follows:

In 2004, Iran claimed that it tested an improved version of the Shahab-3; subsequent statements by Iranian officials suggest that the improved Shahab-3's range is up to 2,000 kilometers and that Iran has the ability to mass-produce these missiles. In addition, Iran's solid-propellant rocket and missile programs are progressing, and Iran has flight-tested a new solid-propellant MRBM with a claimed range of 2,000 kilometers.<sup>55</sup>

The BMDR also asserts that Iran has received extensive support for its missile program from other countries including Russia, China and North Korea. The Shahab-3 MRBM, for example, is based on the North Korean No-Dong missile.<sup>56</sup>

According to the report, Iran also continues to develop long-range missiles that could threaten the U.S. However, there is some uncertainty as to when Iran's ICBM capability will mature.<sup>57</sup> While Iran has not stated its intention to develop ICBMs, two recent launches of Space Launch Vehicles (SLV) indicate Iran is pursuing longer range missiles.

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<sup>54</sup> U.S. Department of Defense, 2010 Ballistic Missile Defense Review Report, 5.

<sup>55</sup> Ibid, 6.

<sup>56</sup> Ibid, 6.

<sup>57</sup> Ibid, iii.

Iran launched its Safir SLV in August 2008 with what it claims was a dummy satellite. Iran used the Safir-2 SLV to place the domestically produced Omid satellite in orbit in February 2009, according to statements made to the press by Iranian officials.<sup>58</sup>

Also of note is the BMDR's reference to the Iranian technique of launching missiles in salvos (multiple missiles launched simultaneously).<sup>59</sup> Along with other potential countermeasures, this technique demonstrates Iranian interest in capabilities and techniques that could defeat missile defense systems.

#### National Air and Space Intelligence Center Report

The U.S. National Air and Space Intelligence Center's (NASIC) April 2009 Ballistic and Cruise Missile Threat report provides details and analysis on the Iranian ballistic missile threat. For the most part, NASIC's findings match those mentioned in other U.S. government sources. However, NASIC provides some additional details that help to better understand the nature of the Iranian threat.

While they are not capable of reaching Europe due to range limitations, NASIC identifies Iran's four SRBMs and their approximate ranges. These include the Fateh-110 (190 km), Shahab-I (300 km), Shahab-II (500 km) and CSS-8 (150 km). These short-range missiles could reach Turkey and U.S. forces in Iraq and Afghanistan. In total, NASIC assesses that Iran has fewer than 100 short-range ballistic missile launchers, but notes that the actual missile inventories could be larger, because launchers can be reused to fire multiple missiles.<sup>60</sup>

Regarding Iran's MRBMs, whose ranges make them capable of reaching NATO members Turkey, Greece, Bulgaria and Romania, NASIC's assessment is in line with

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<sup>58</sup> Ibid, 4.

<sup>59</sup> Ibid, 8.

<sup>60</sup> National Air and Space Intelligence Center, Ballistic and Cruise Missile Threat, 12-13.

that of the BMDR that Iran has made efforts to extend the range of its missiles by modifying the Shahab-3 and by testing a new solid-propellant MRBM. NASIC also provides additional details on its estimate of the number of launchers in Iran's inventory. This includes fewer than 50 launchers for all Shahab-3 variants (the Shahab-3 with a range of 1,290 km, and the Shahab-3 variant with a range of approximately 1,900 km), although there may be several missiles available for each launcher. For the new Iranian MRBM and ICBM, NASIC assesses that the number of launchers as being either "not yet deployed" or "undetermined."<sup>61</sup>

Like the BMDR, NASIC notes Iran's SLV launches in 2008 and 2009 and assesses that these launches can serve as a "test bed" to further Iran's long-range ballistic missile efforts. Additionally, the report states that, "with sufficient foreign assistance, Iran could develop and test an ICBM capable of reaching the United States by 2015."<sup>62</sup>

#### Congressional Research Service

In addition to U.S. government official sources, it is interesting to consider the reports and analysis of respected research centers that have undertaken detailed consideration of the Iranian missile threat.

The Congressional Research Service (CRS) is a Washington D.C.-based, nonpartisan, U.S.-funded agency, which conducts research for members and committees of Congress. In February 2009, CRS published a report titled, "Iran's Ballistic Missile Programs: An Overview," in which it compiled details from intelligence and unclassified sources on Iran's ballistic missile program.

According to the CRS report, experts believe that Iran's Shahab-3 MRBM is a

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<sup>61</sup> Ibid, 15-17.

<sup>62</sup> Ibid, 3.

derivative of North Korea's No-Dong 1 ballistic missile and that it has a range of about 1,000-1,500 km, which could reach targets throughout most of the Middle East. As mentioned in U.S. official documents, CRS states Iran has Shahab-3 variants that have a longer range and could reach southeastern Europe.

Longer range versions of the Shahab-3, variously referred to as Shahab-3 variants, the Shahab-3A, Shahab-3B, and Shahab-4, and a BM-25, may have capabilities of 1,500-2,500 kilometers. These missiles potentially could reach targets throughout the Middle East, Turkey, and into southeastern Europe. Some have reported that perhaps several dozen or more of these missile types may be deployed and operational.<sup>63</sup>

According to CRS, uncertainty exists regarding other Iranian MRBM development. For example, in November 2008, Iran said it has successfully tested a 2-stage solid-propellant missile with a range of 2,000 km. However, a Pentagon spokesman said the launch could not be confirmed. Additionally, the CRS report states that analysts are skeptical of Iranian claims, and other analysts have cited past Iranian exaggerations of missile capabilities.

Other reports have also surfaced over Iran's development of a much longer MRBM with ranges of 4,000-5,000 kilometers, or even a space launch vehicle derived from these efforts that some refer to as the Shahab-5. The degree to which this effort might be actually underway also is highly uncertain.<sup>64</sup>

CRS also notes that as with the MRBM program, there is uncertainty about Iran's long-range or ICBM program. The long-standing unclassified U.S. intelligence assessment is that Iran may be able to test an ICBM by 2015 with outside assistance from a country like Russia, China, or North Korea.<sup>65</sup> However, there is no consensus on this assessment. While some analysts believe it is very likely Iran will test an ICBM before 2015, others believe this is a worst-case analysis of the potential threat from Iran. While

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<sup>63</sup> Hildreth, "Iran's Ballistic Missiles Programs: An Overview," 3.

<sup>64</sup> Ibid, 4.

<sup>65</sup> Hildreth, "Long-Range Ballistic Missile Defense in Europe," 5.



Iran declares it has no plans for an ICBM program, some analysts have referred to Iran's ICBM program as the Shahab-6 or Kosar system. However, CRS concludes that "...there appears to be considerable public uncertainty and debate as to whether the Shahab-6 is an actual design study concept, or an active or abandoned Iranian ICBM or even space-launch program."<sup>66</sup>

#### International Institute for Strategic Studies

The London-based International Institute for Strategic Studies (IISS) is a leading research and publishing organization that focuses on global political and military issues. In May 2010, the IISS published a report titled, "Iran's Ballistic Missile Capabilities: A Net Assessment," which examined Iran's current ballistic missile and nuclear programs. The IISS report makes a number of key points related to the Iranian ballistic missile threat.

First, despite Iranian claims to the contrary, the IISS report concludes that Iran is continuing to develop its nuclear and ballistic missile programs, and that the two programs appear to be linked in such a way that Iran aims to obtain the capability to deliver nuclear weapons well beyond its borders. However, while current Iranian missile capabilities could theoretically reach Turkey and parts of Greece, Bulgaria and Romania, Iran is not likely to have a capability to threaten Western Europe until 2014-2015, and is more than a decade away from developing a missile capable of reaching the east coast of the U.S.

Second, the IISS provides details on current Iranian missile capabilities. Of note, the IISS's range estimates for Iran's ballistic missiles are slightly lower than those put forth in U.S. government documents but not significantly lower. IISS states that the

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<sup>66</sup> Hildreth, "Iran's Ballistic Missiles Programs: An Overview," 2-3.

Shahab-3 was commissioned in mid-2003, has a range of approximately 900 km and can carry a payload of approximately 1,000 kg. The modified version of the Shahab-3, the Ghadr-1, began its flight testing in 2004 and has a “theoretical” range of 1,600 km, but with a smaller (750 kg) payload than the Shahab-3. Available information indicates Iran has approximately six Shahab-3/Ghadr-1 transporter-erector-launcher (TEL) vehicles, but Iran may be adding to this number. The Sajjil-2, which was first flight tested in November 2008, is a solid-propellant MRBM with a range of approximately 2,200 km with a payload of 750 kg. The IISS assesses that the Sajjil-2 is two to three years of flight testing away from becoming operational. Also of significance, the report notes that, “Iran is the only country to have developed a missile of this reach without first having developed nuclear weapons.”<sup>67</sup>

Third, looking to the foreseeable future, IISS assesses that if Iran were to seek to develop a missile with a range capable of reaching Western Europe, it would need a much larger missile. The most probable configuration of such a missile would be a multi-stage missile powered by engine clusters. In February 2010, Iran unveiled a mock-up of the two-stage, Simorgh launch vehicle, which was based on a cluster of four No-Dong engines. A notional Iranian intermediate-range ballistic missile could resemble this configuration. However, the time required for missile development and flight testing of an Iranian missile capable of reaching Western Europe in any configuration (two- or three-stage, liquid- or solid-propellant) would be at least four or five years. It is also likely that Iran would develop an intermediate-range missile before attempting to develop an ICBM. Based on the experience of Iran’s and other missile-development programs,

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<sup>67</sup> John Chipman, “Iran’s Ballistic Missile Capabilities: A Net Assessment,” Press Statement, International Institute for Strategic Studies, May 10, 2010, 1.

IISS assessed that it is reasonable to conclude that Iran is more than a decade away from developing an ICBM capable of threatening the U.S. For example, IISS notes that France's M4 submarine-launched ballistic missile, which has a range of approximately 4,000-5,000 km, came into operation 14 years after its predecessor, the 3,000 km-range M2 missile. Similarly, the long-range Chinese DF-31 ballistic missile became operational more than a decade after the DF-21. IISS concludes there is no evidence that Iran will be able to shorten long-range missile development timelines.<sup>68</sup> A less likely outcome would be one whereby Iran receives "massive foreign assistance," which could reduce the time required for Iran to develop its missile capabilities.

Fourth, IISS states that Iran's future progress "may still depend on significant foreign support and the supply of key materials, equipment and components."<sup>69</sup> For example, Iran's current ballistic missile arsenal is severely limited by poor accuracy and Iran must import at least some components of its missile's navigation and guidance systems.

Finally, IISS notes that a problem with analyzing Iran's ballistic missile program and its prospects is lack of sufficient information. For example, Iranian media often only receives limited information, the government ensures optimistic assessments are produced, and Iran has in the past released misleading photographs.

With one significant exception, it is interesting to note the broad coincidence of assessments between U.S. government documents and the IISS report. The notable exception is the Iranian ICBM threat development timeline. Whereas some U.S. assessments indicate Iran could have an ICBM capability by 2015, IISS assesses Iran is

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<sup>68</sup> "Obama's New Missile-Defence Strategy," The International Institute for Strategic Studies, Volume 15, Issue 08, October 2009, [www.iiss.org/EasySiteWeb/getresource.axd?AssetID=32113&type](http://www.iiss.org/EasySiteWeb/getresource.axd?AssetID=32113&type).

<sup>69</sup> Chipman, "Iran's Ballistic Missile Capabilities: A Net Assessment," 2.

more than a decade away from developing an ICBM capable of threatening the U.S. (in the 2020 timeframe).

### EastWest Institute

The EastWest Institute (EWI) is an international, non-partisan, nonprofit policy organization focused on confronting critical challenges that endanger peace. The institute has offices in New York, Brussels and Moscow. In May 2009, EWI published a report titled, “Iran’s Nuclear and Missile Potential, A Joint Threat Assessment by U.S. and Russian Technical Experts.” The project, whose participants included ambassadors, generals and scientists from the U.S. and Russia, took one year to complete. Below are several key points related to the Iranian ballistic missile threat. Later, this paper will address the institute’s findings on missile defenses in Europe. EWI’s assessments tend to underestimate Iran’s capabilities relative to the other sources considered in this research. This could be due to the partial Russian make-up of the EWI’s Joint Threat Assessment group and the fact that Russian experts generally view Iran’s ballistic missiles as less threatening than many of their U.S. counterparts.

First, EWI outlines basic Iranian missile capabilities, which include the following: Shahab-1 (315 km range), Shahab-2 (375 km range), Shahab-3 (930 km range) and Shahab-3M (1,100 km range). Of note, all of these missiles are single-stage, liquid-propellant, and are based on North Korean missiles -- the SCUD-B, SCUD-C and No-Dong respectively. The Shahab-3M, also referred to as the Ghadr-1, is a Shahab-3 variant that carries more propellant. “The various modifications of the Shahab-3 constitute the main missile threat from Iran today.”<sup>70</sup> The EWI assessment also makes

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<sup>70</sup> EastWest Institute, “Iran’s Nuclear and Missile Proliferation, A Joint Threat Assessment by U.S. and Russian Technical Experts,” May 2009, <http://www.ewi.info/groundbreaking-us-russia-joint-threat->

reference to reports that Iran has developed solid-propellant missiles with a range of 2,000 km, but states that there is no reliable information upon which to judge these reports.<sup>71</sup> Additionally, EWI states that reports that Iran is developing other new longer-range missiles such as the Shahab-4, Shahab-5 and Shahab-6 with ranges up to 5,000-6,000 km are not supported by any information, photographic or otherwise.

Second, the EWI report addresses Iran's space program and its implications for ballistic missile development. In February 2009, Iran launched a liquid-propellant, two-stage Safir SLV to place the 27 kg Omid satellite into orbit. While some experts suggested the Safir SLV could serve as a prototype for a longer-range Iranian ballistic missile, EWI did not consider it a "fundamental technological breakthrough."<sup>72</sup> EWI characterized the SLV as a step in the development of Iranian missile staging technology, but emphasized that while the SLV was optimal for launching a small satellite, it would not be suitable for carrying a notional nuclear warhead of roughly 1,000 kg.

Third, looking forward, EWI judges that Iran faces major obstacles in developing longer range ballistic missiles such as IRBMs or ICBMs. The major technological and scientific problems Iran would have to solve include: development of rocket motors; flight control, guidance systems, and telemetry; reentry vehicle heat protection; construction materials; and flight testing.<sup>73</sup> However, unlike in the U.S., Russia and China, Iran lacks the infrastructure such as research institutions, industrial plants, scientists and engineers to move beyond its skillful use of missile components from other countries. Further, Iran lacks access to world markets for high-tech equipment, materials

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[assessment-iran-0](#), 8.

<sup>71</sup> Ibid, 7.

<sup>72</sup> Ibid, 8.

<sup>73</sup> Ibid, 9.

and missile components. While Iran's ballistic missile program benefits from foreign assistance, the international nonproliferation regime for missiles and related technologies -- MTCR, HCOC and PSI -- has increased the barriers that Iran faces when developing its ballistic missiles.

Fourth, the EWI project looks at the prospects for Iranian ballistic missile development and associated timelines for employing a nuclear weapon. Based on technologies available to it, Iran could develop a ballistic missile with a range of 2,000 km capable of delivering a 1,000 kg nuclear warhead in six to eight years. This is based on estimates of the time required for Iran to produce a nuclear device small enough and light enough for an Iranian missile to deliver it. Also, with existing technology and components, Iran could develop a missile with a range of 3,000 km or more. The missile configuration would possibly use a cluster of rocket motors in its first stage, would require further development of missile staging technology, along with the development of additional expertise with flight control and warheads able to withstand the reentry heat. EWI estimates that mastering these technologies without external assistance would require "perhaps ten years of concerted and visible effort."<sup>74</sup>

#### Middle East Perspective

At the same time that the U.S. is working with NATO to bolster missile defenses in Europe to counter the Iranian threat, the U.S. is working with allies in the Middle East who are also concerned about the Iranian and related missile threats. And while the Middle East and Europe, and their respective missile defense architectures, are geographically separated, together they constitute a broader effort to contain Iran's ballistic missile threat. According to U.S. officials, the U.S. has been expanding land-

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<sup>74</sup> Ibid, 9.

and sea-based missile defense systems around the Gulf in order to counter the Iranian threat. “The deployments include expanded land-based Patriot defensive missile installations in Kuwait, Qatar, the United Arab Emirates (UAE) and Bahrain, as well as Navy ships with missile defense systems in and around the Mediterranean.”<sup>75</sup> In 2008, the U.S. installed a radar ground station in Israel and is looking for another country in the Gulf to host a second radar station. If linked to command-and-control systems, the Middle East-based radars will provide early warning data on an Iranian ballistic missile launch to European-based missile defense assets.<sup>76</sup> Thus, the threat perceptions and missile defense initiatives of countries in the Middle East -- e.g., the UAE, Saudi Arabia and Israel -- are worthy of consideration.

The UAE has been one of the most vocal states in the Middle East in expressing concern over the threat from Iran. At a July 2010 conference in the U.S., the UAE’s Ambassador to the U.S., Yousef al-Otaiba, highlighted growing perceptions about the Iranian threat saying, “...There’s no country in the region that is a threat to the UAE [besides] Iran.”<sup>77</sup> Additionally, in an unusually direct affront to Iran, Ambassador Otaiba even expressed support for an attack on Iranian nuclear facilities saying, “A military attack on Iran by whomever would be a disaster, but Iran with a nuclear weapon would be a bigger disaster.”<sup>78</sup> Tensions between the UAE and Iran are not new. Unrelated to the nuclear issue, the two countries have also been in a dispute over three islands in the

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<sup>75</sup> Jim Wolf, “U.S. Missile Test Mimicking Iran Strike Fails,” *Reuters*, February 1, 2010, <http://www.reuters.com/article/idUSN0120076120100201>.

<sup>76</sup> Craig Whitlock, “Anti-Missile Shield Close to Reality in Europe,” *The Washington Post*, August 1, 2010, <http://www.washingtonpost.com/wp-dyn/content/article/2010/07/31/AR2010073103048.html>.

<sup>77</sup> James M. Dorsey, “UAE Toughens Stance over Iran’s Nuclear Ambitions,” *World Politics Review*, July 12, 2010, <http://www.worldpoliticsreview.com/articles/6019/uae-toughens-stance-over-irans-nuclear-ambitions>.

<sup>78</sup> Alexander Smolczyk and Bernhard Zand, “Persian Isolation: A Quiet Axis Forms against Iran in the Middle East,” *Spiegel Online International* (Germany), July 15, 2010, <http://www.spiegel.de/international/world/0,1518,706445,00.html>.

Persian Gulf since 1971.<sup>79</sup>

Despite the estimated annual bilateral trade of over \$10 billion between Iran and the UAE, the Emirates are applying economic and political pressure on Iran. In June 2010, the UAE implemented sanctions imposed against Iran by UNSC resolutions when the UAE central bank froze 41 accounts, some of which were linked to Iran's Islamic Revolutionary Guard Corps (IRGC) and could be tied to the smuggling of illicit goods to Iran. Furthermore, searches of Iranian ships in Dubai have increased. Hamad Al Kaabi, the UAE's permanent representative to the IAEA said, "Security forces have interdicted scores of ships suspected of carrying illicit cargo."<sup>80</sup> The UAE's efforts noted above are significant in that they highlight cooperation in the Middle East to implement UN sanctions against Iran and to counter Iranian proliferation of ballistic missile components.

While the UAE has taken the strongest position among Gulf countries toward Iran, Saudi Arabia is an example of another Arab country which has voiced concerns about the perceived threat posed by Iran's nuclear program. Speaking at a 2006 conference in London, Saudi Arabia's Foreign Minister Prince Saud al-Faisal, warned Iran of the potential for a new arms race in the region. He said, "We are urging Iran to accept the position that we have taken to make the Gulf, as part of the Middle East, nuclear free and free of weapons of mass destruction. We hope that they will join us in this policy and assure that no new threat of arms race happens in this region."<sup>81</sup> In February 2010, ahead of a new round of UNSC sanctions deliberations, Saudi Arabia's Foreign Minister warned that Iran could develop a nuclear weapon before sanctions can

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<sup>79</sup> Ian Black, "UAE Ambassador Backs Strike on Iran's Nuclear Sites," *The Guardian* (UK), July 7, 2010, <http://www.guardian.co.uk/world/2010/jul/07/uae-envoy-iran-nuclear-sites>.

<sup>80</sup> Smolczyk and Zand, "Persian Isolation."

<sup>81</sup> Richard Beeston, "Saudis Warn Iran that Its Nuclear Plan Risks Disaster," *The Sunday Times* (UK), January 16, 2006, [http://www.timesonline.co.uk/tol/news/world/middle\\_east/article789045.ece](http://www.timesonline.co.uk/tol/news/world/middle_east/article789045.ece).



take effect saying, "...sanctions are a long-term solution. They may work. We can't judge...but we see the issue in the shorter term maybe because we are closer to the threat..."<sup>82</sup>

Due, in part, to a perceived Iranian threat, Saudi Arabia is purchasing large numbers of military weapons systems from the U.S and worldwide. Between 2001 and 2008, Saudi Arabia spent over \$30 billion on military weapons systems. Additionally, Saudi Arabia plans to spend more than \$60 billion over the next 10 years in arms purchases from the U.S. including systems such as the UH-60 Black Hawk helicopter, the AH-64 Apache attack helicopter and F-15 fighter aircraft.<sup>83</sup>

Israel is another country in the Middle East that feels threatened by the prospect of Iranian ballistic missiles and Iran's nuclear program. Many Israelis perceive Iran as a threat to Israel's existence. Iran's President Mahmoud Ahmadinejad has in the past made anti-Semitic remarks, questioned the legitimacy of Israel and denied that the holocaust actually occurred. Additionally, Iran has been for many years a supporter of anti-Israeli groups in the Middle East such as Hezbollah.

In terms of the way Israel perceives the nature of the threat, Israel's Defense Minister Ehud Barak said in a July 2010 interview with the Washington Post that Iran is determined to obtain a nuclear weapons capability and that Iran's nuclear aspirations are a threat to any conceivable world order. Further, he said a nuclear Iran would lead to an arms race in the Middle East, would intimidate its Arab neighbors, and would give a

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<sup>82</sup> "Saudi Warning That Sanctions against Iran May Not Work," *The Daily Telegraph* (UK), February 16, 2010, <http://www.telegraph.co.uk/news/worldnews/middleeast/iran/7248785/Saudi-warning-that-sanctions-against-iran-may-not-work.html>.

<sup>83</sup> Adam Entous, "U.S.-Saudi Arms Plan Grows to Record Size," *The Wall Street Journal*, August 14, 2010, [http://online.wsj.com/article/NA\\_WSJ\\_PUB:SB10001424052748703960004575427692284277852.html](http://online.wsj.com/article/NA_WSJ_PUB:SB10001424052748703960004575427692284277852.html), 7.

boost to terrorist groups in the region.

With regard to Iran's ballistic missiles, Minister Barak said Iran now has missiles that can reach Eastern Europe, parts of Russia and former Soviet states, and might reach Western Europe in five years.<sup>84</sup> After Iran launched a satellite in February 2009 using a Safir-2 SLV, Uzi Rubin, former head of Israel's Ballistic Missile Defense Organization, said "Iran is now poised to project power globally" and suggested that efforts to control missile technology internationally were not working.<sup>85</sup>

Addressing UN sanctions against Iran and Israeli actions going forward, Minister Barak stated that there is still time for UN sanctions to work. However, he believes that sanctions need to be much tighter and at a press conference with the U.S. Secretary of Defense he left open the possibility of an Israeli attack against Iranian nuclear sites. He said, "We clearly believe that no option should be removed from the table. This is our policy. We mean it. We recommend to others to take the same position but we cannot dictate it to anyone."<sup>86</sup> Statements such as this coming from Israeli leaders, combined with past Israeli attacks on Arab weapons of mass destruction (WMD) facilities -- Iraq in 1981 and Syria in 2007 -- have led to speculation in the U.S. media that Israel will attack Iran's nuclear facilities.

To mitigate the Iranian ballistic missile threat, Israel continues to work unilaterally and bilaterally with the U.S. to bolster its missile defenses. Mr. Barak has described Israel's missile defenses as a multi-layer interception system: the Iron Dome is

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<sup>84</sup> Janine Zacharia, Edited Excerpts of Interview with Israeli Defense Minister Ehud Barak at the Defense Ministry in Tel Aviv, *The Washington Post*, July 23, 2010, <http://www.washingtonpost.com/wp-dyn/content/article/2010/07/26/AR2010072602020.html>.

<sup>85</sup> Greg Bruno, "Iran's Ballistic Missile Program," Council on Foreign Relations, October 15, 2009, [http://www.cfr.org/publication/20425/irans\\_ballistic\\_missile\\_program.html](http://www.cfr.org/publication/20425/irans_ballistic_missile_program.html), 4.

<sup>86</sup> James Hider, "Ehud Barak Warns Iran of Possible Israeli Strike on Nuclear Facilities," *The Times Online* (UK), July 27, 2010, [http://www.timesonline.co.uk/tol/news/world/middle\\_east/article6729276.ece](http://www.timesonline.co.uk/tol/news/world/middle_east/article6729276.ece).

a short-range system that can protect a city; David's Sling protects against medium-sized rockets and missiles including cruise missiles; the Arrow system is the third layer; and the Super Arrow, which is in development, is intended to intercept missiles coming from inside of Syria or Iran.<sup>87</sup>

### Russian Perspective

There is no unified Russian threat perception of Iran. Russian threat perceptions of Iran are divided between the political elite who see Iran's ballistic missile and nuclear programs as threatening and those in the Russian nuclear, energy and defense sectors who stand to gain from engagement with Iran. However, Russian elites do not view Iran as presenting an immediate or direct threat to Russian troops or territory; a markedly different view from the U.S. and NATO.

The statements of Russian leaders indicate they understand that Iran continues to develop longer range ballistic missiles and that Iran's nuclear program lacks transparency, but their statements and actions also suggest that Russia views Iran less as a threat and more as partner to be engaged with, particularly economically.

Two comments by Russian President Medvedev provide insight into Russian threat perceptions of Iran. Speaking on a proposed U.S. missile defense system for Europe and the ballistic missile threat at a July 2009 joint press conference with President Obama in Moscow, President Medvedev said, "We realize fully well that the number of threats, including link[ed] to the medium-range and ballistic missiles, is not diminishing but is growing in number."<sup>88</sup> When the two Presidents were asked about nuclear

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<sup>87</sup> Zacharia, Interview with Israel Defense Minister.

<sup>88</sup> The White House, Press Conference by President Obama and President Medvedev of Russia, July 6, 2009, [http://www.whitehouse.gov/the\\_press\\_office/Press-Conference-by-President-Obama-and-President-Medvedev-of-Russia](http://www.whitehouse.gov/the_press_office/Press-Conference-by-President-Obama-and-President-Medvedev-of-Russia).

nonproliferation trends, President Obama said, “There is deep concern about Iran’s pursuit of [a] nuclear weapons capability.” President Medvedev again did not mention Iran by name but stated in a thinly veiled reference to Iran, “...there are negative trends in the world and they are due to the emergence of new nuclear players. Some of them are not officially members of the nuclear club, but they have aspirations to have nuclear weapons and declare so openly or, which is worse, doing it clandestinely. And of course it has a very negative bearing on the world.”<sup>89</sup>

In an attempt to counter what President Medvedev calls negative trends, Russia has agreed to UNSC sanctions against Iran, but President Medvedev has also voiced opposition to adding any sanctions beyond those imposed by the UN.<sup>90</sup> Russian support of UNSC sanctions reflects increasing frustration with Iran’s lack of transparency in its nuclear program, and also reflects an increased Russian willingness to work with the new U.S. administration more broadly on security cooperation issues such as Iran, missile defense and the reduction of strategic nuclear arms.

A review of Russia’s new Military Doctrine, approved in February 2010, reveals that while Russia views missile proliferation as a threat, the doctrine makes no specific reference to Iran. Russia’s Military Doctrine lists eleven “main external military dangers” including the ballistic missile threat. Specific to the ballistic missile threat, the Russian Doctrine states that one external military danger is, “The proliferation of weapons of mass destruction, missiles, and missile technologies, and the increase in the number of states possessing nuclear weapons.”<sup>91</sup> Of significance, Russia’s Military

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<sup>89</sup> Ibid.

<sup>90</sup> Andrew E. Kramer, “Russia Plan to Help Iran Challenge Sanctions,” *New York Times*, July 15, 2010, <http://www.nytimes.com/2010/07/15/world/europe/15russia.html>, 10.

<sup>91</sup> The Russian Federation, *The Military Doctrine of the Russian Federation*, February 5, 2010,

Doctrine also lists NATO expansion and missile defense systems as external military dangers, a topic that will be addressed more in the next chapter of this paper.

In spite of the Iranian ballistic missile threat, Russia is pursuing a dual-track policy of engagement, and political and economic pressure (e.g., sanctions) toward Iran. However, the overriding trend appears to be one of Russian engagement with Iran, as opposed to a Russian sense of danger from Iran and resultant hostile posture toward Tehran. Russia's involvement in Iran's Bushehr nuclear power plant and recent security and energy cooperation efforts between the two countries are illustrative of Russia's engagement policy toward Iran. Since the mid-1990s, Russia has helped to build Iran's Bushehr 1,000 MW nuclear power plant and to provide fuel for the plant. Spent fuel rods are to be returned to Russia. Under these arrangements, Russia retains some visibility on Iran's nuclear activities. Regarding security cooperation, in 2007, Russia signed a contract to sell S-300 surface-to-air missiles to Iran,<sup>92</sup> but the missiles have not yet been delivered, likely due to UNSC sanction prohibitions. Finally, regarding energy cooperation, Russian and Iranian Energy Ministers met in Moscow in July 2010 and announced plans for closer cooperation between the two countries petroleum industries. The ministers issued a joint statement praising, "...active cooperation between Russian and Iranian companies in the oil, gas and petrochemical sectors, which are developing and widening in their joint work."<sup>93</sup>

#### Iranian Ballistic Missile Threat Summary

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[http://merln.ndu.edu/whitepapers/Russia2010\\_English.pdf](http://merln.ndu.edu/whitepapers/Russia2010_English.pdf).

<sup>92</sup> Ali Akbar Dareini, "Iran Says it Has S-300 Missiles," *Associated Press*, August 5, 2010, [http://news.yahoo.com/s/ap/20100804/ap\\_on\\_re\\_mi\\_ea/iran\\_missiles](http://news.yahoo.com/s/ap/20100804/ap_on_re_mi_ea/iran_missiles).

<sup>93</sup> Kramer, "Russia Plan to Help Iran Challenge Sanctions."

Figure 1 presents research information from Chapter 2 pertaining to Iran's ballistic missile capabilities. The greatest ballistic missile threat to Europe is from Iran's Ghadr-1 (Shahab-3 variant) and from Iran's solid-propellant MRBM (Sajjil-2). The Ghadr-1's estimated range is between 1,100 km and 2,000. However, three of five range estimates are 1,800 km, 1,900 km and 2,000 km -- the upper ends of the parameter. The Sajjil-2 solid propellant MRBM's estimated range is between 2,000 km and 2,200 km. However, it is worth noting again the IISS's assessment that the Sajjil-2 is two to three years away from becoming operational.

As noted at the bottom of Figure 1, estimates for Iranian ICBM development timelines vary considerable. This topic is address further in Chapter 5, conclusions and recommendations.

Figure 1: Iranian Ballistic Missile Ranges, ICBM Development Timeline

Iranian Missile Type	Range (km)
<b>Shahab 1 (North Korean SCUD-B, single stage, liquid propellant)</b>	
-- Ballistic Missile Defense Review (BMDR)	300
-- National Air and Space Intelligence Center (NASIC)	300
-- International Institute for Strategic Studies (IISS)	Not given
-- EastWest Institute (EWI)	315
-- Jane's Defense Equipment and Technology	300
<b>Shahab 2 (North Korean SCUD-C, single stage, liquid propellant)</b>	
-- Ballistic Missile Defense Review (BMDR)	500
-- National Air and Space Intelligence Center (NASIC)	500
-- International Institute for Strategic Studies (IISS)	Not given
-- EastWest Institute (EWI)	375
-- Jane's Defense Equipment and Technology	550
<b>Shahab 3 (North Korean No Dong, single stage, liquid propellant)</b>	
-- Ballistic Missile Defense Review (BMDR)	1300
-- National Air and Space Intelligence Center (NASIC)	1300
-- International Institute for Strategic Studies (IISS)	900
-- EastWest Institute (EWI)	930
-- Jane's Defense Equipment and Technology	1300
<b>Ghadr 1 (Shahab 3M) (Single stage, liquid propellant, variant of Shahab-3)</b>	
-- Ballistic Missile Defense Review (BMDR)	2000
-- National Air and Space Intelligence Center (NASIC)	1900
-- International Institute for Strategic Studies (IISS)	1600
-- EastWest Institute (EWI)	1100
-- Jane's Defense Equipment and Technology	1800
<b>Solid Propellant MRBM (Sajjil 2)</b>	
-- Ballistic Missile Defense Review (BMDR)	2000
-- National Air and Space Intelligence Center (NASIC)	Undetermined
-- International Institute for Strategic Studies (IISS)	2200
-- EastWest Institute (EWI)	2000
-- Jane's Defense Equipment and Technology	2000
<b>ICBM</b>	Development Timeframe
-- Ballistic Missile Defense Review (BMDR)	Not given
-- National Air and Space Intelligence Center (NASIC)	Test by 2015 w/ foreign assistance
-- Congressional Research Service (CRS)	Could test by 2015 w/ foreign assistance
-- International Institute for Strategic Studies (IISS)	W. Europe 2014-2015; U.S. 2020+
-- U.S. European Command, GEN Craddock Congressional Testimony	2015



Figure 2 overlays Iranian ballistic missile ranges on a map of the Middle East and Europe. From a technical capabilities standpoint, as a neighboring country to Iran, NATO's southeastern most member Turkey is within range of both Iran's short- and medium-range ballistic missiles. In southeastern Europe, NATO members Greece, Bulgaria and Romania are within the 2,000 km range of a Ghadr-1 MRBM. If the Sajjil-2's range of 2,200 km is accurate and Iran can move the system into an operational status, then it could also range further into Europe including portions of NATO members Albania, Hungary, Slovakia and Poland.

Figure 2: Iranian Ballistic Missile Threat Overview Map





## CHAPTER 3

### MISSILE DEFENSE POLICIES AND CAPABILITIES

The proliferation of ballistic missiles poses an increasing threat to Allies' populations, territory and forces... We welcome the new phased adaptive approach of the United States to missile defence, which further reinforces NATO's central role for the Alliance as part of a broader response to counter ballistic missile threats.<sup>94</sup>

NATO Foreign Ministers' Meeting, Final Statement, December 4, 2009

#### Introduction

From the perspective of many, Iran presents a growing ballistic missile threat to the security of the U.S., NATO and the Middle East. As a result, many nations have bolstered their ballistic missile defenses to deter and protect against a potential Iranian attack. This chapter presents information and views from multiple perspectives on U.S. and NATO missile defense policies and capabilities for Europe. The perspectives considered include the views of NATO, the U.S., Russia and various research centers and NGOs.

#### NATO Missile Defense Policy

There are three components of NATO's missile defense policy. First, the Active Layered Theatre Ballistic Missile Defense (ALTBMD) Program, which was established in September 2005, is aimed at protecting Alliance forces from short- and medium-range ballistic missiles. The ALTBMMD is focused on the integration of NATO's command and control (C2) systems and communication network to enable the exchange of information between NATO and national missile defense systems. Second, in April 2009, Allies

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<sup>94</sup> NATO, Final Statement, Meeting of the North Atlantic Council at the level of Foreign Ministers held at NATO Headquarters, Brussels, December 4, 2009, [http://www.nato.int/cps/en/natolive/news\\_59699.htm](http://www.nato.int/cps/en/natolive/news_59699.htm), para. 14.

directed that work be done to prepare options for a comprehensive missile defense of all Allied territory. These options are to be considered at the NATO Summit in November 2010. Finally, under the auspices of the NATO-Russia Council (NRC), NATO is engaged in Theater Missile Defense (TMD) cooperation with Russia. Under the NRC TMD project, multiple computer assisted exercises have been held since 2003.<sup>95</sup>

When speaking at a March 2010 Brussels Forum, NATO Secretary General Rasmussen emphasized how missile defense is an opportunity to bring NATO and Russia together saying, “We need a missile defence system that includes not just all countries of NATO, but Russia too. One security roof, that we build together, that we support together and that we operate together. One security roof that protects us all.”<sup>96</sup>

Several documents provide the framework for NATO’s policy and activities related to TMD and missile defense. NATO’s 1999 Strategic Concept initially recognized the need for TMD citing the “...the risks and potential threats of the proliferation of NBC weapons and their means of delivery...”<sup>97</sup> At that time, NATO’s focus was on TMD, which is intended to protect troops operating in the field. After the U.S. withdrew from the Anti-Ballistic Missile (ABM) Treaty, which limited U.S. missile defense to a single site, in 2002 the U.S. and NATO started to consider the feasibility for missile defense of NATO territory.<sup>98</sup> The shift in 2002 toward a possible NATO missile defense mission represented a considerable expansion to the protection previously envisioned under the TMD concept.

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<sup>95</sup> NATO, Missile Defense Programme Overview, [http://www.nato.int/cps/en/natolive/topics\\_49635.htm](http://www.nato.int/cps/en/natolive/topics_49635.htm).

<sup>96</sup> NATO, Newsroom, “One Security Roof” from Vancouver to Vladivostok, March 27, 2010, [http://www.nato.int/cps/en/natolive/news\\_62391.htm?mode=news](http://www.nato.int/cps/en/natolive/news_62391.htm?mode=news).

<sup>97</sup> NATO, The Alliance’s Strategic Concept, April 24, 1999, [http://www.nato.int/cps/en/natolive/official\\_texts\\_27433.htm](http://www.nato.int/cps/en/natolive/official_texts_27433.htm), para. 56.

<sup>98</sup> David S. Yost, “NATO’s Evolving Purposes and the Next Strategic Concept,” *International Affairs*, Volume 86, Issue 2, March 10, 2010, 508.

In 2002 at the Prague Summit, Allies “...initiated a new NATO Missile Defence Feasibility Study to examine options for protecting Alliance territory, forces and population centres against the full range of missile threats...”<sup>99</sup> In November 2006 at the Riga Summit, NATO concluded that missile defense is technically feasible and directed that additional work be done to determine the political and military implications of missile defense and also directed that a threat assessment be updated.<sup>100</sup> In April 2008, NATO’s Bucharest Summit Declaration acknowledged: that ballistic missile proliferation posed an increasing threat to Allies’ forces, territory and populations and specifically referenced Iran’s ballistic missile program; recognized the planned deployment of U.S. missile defense assets to Europe; and emphasized the importance of NATO-Russia missile defense cooperation.<sup>101</sup> In April 2009, Allies reaffirmed many previously agreed-to missile defense conclusions and directed that work be done to look at options for possibly expanding the role of NATO’s ALTBMD beyond protecting deployed forces, to include also the protection of NATO territory.<sup>102</sup> In December 2009, Allies welcomed the U.S. PAA for missile defense in Europe and said that if NATO decides to take missile defense of NATO territory on as a mission, then the PAA would be a valuable national contribution to NATO’s capability and to Alliance security.<sup>103</sup>

Looking forward to the costs of a broader NATO missile defense mission, NATO Secretary General Rasmussen said in May 2010 that the cost of missile defense for

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<sup>99</sup> NATO, Prague Summit Declaration, November 21, 2002, [http://www.nato.int/cps/en/natolive/official\\_texts\\_19552.htm](http://www.nato.int/cps/en/natolive/official_texts_19552.htm), para. 4g.

<sup>100</sup> NATO, Riga Summit Declaration, November 29, 2006, [http://www.nato.int/cps/en/natolive/official\\_texts\\_37920.htm](http://www.nato.int/cps/en/natolive/official_texts_37920.htm), para. 25.

<sup>101</sup> NATO, Bucharest Summit Declaration, April 3, 2008, [http://www.nato.int/cps/en/natolive/official\\_texts\\_8443.htm](http://www.nato.int/cps/en/natolive/official_texts_8443.htm), paras. 28-29, 37-38, 41.

<sup>102</sup> NATO, Strasbourg / Kehl Summit Declaration, paras. 50-54.

<sup>103</sup> NATO, Final Statement, Foreign Ministers Meeting, Brussels, paras. 14-16.

NATO territory would be less than 200 million Euros (\$250 million), over ten years, but that number has received some skepticism as being too low.<sup>104</sup> For example, in March 2010, France's Foreign Minister expressed doubts about the potential NATO missile defense mission and cited tightening defense budgets as a principal reason.<sup>105</sup>

### NATO Missile Defense Capabilities

NATO is currently developing an ALTBMD interim capability, which is limited to the TMD mission and is scheduled for completion by December 2010. According to NATO's ALTBMD Chief, Italian Air Force Brigadier General Alessandro Pera, the interim capability "...will allow different NATO countries to plug their sensors into a shared network so that they can identify threats earlier and to work out the optimum locations to deploy their missile interceptors to protect NATO forces."<sup>106</sup> The interim capability is planned to support a NATO Response Force-sized operation, which varies in size depending on the nature of the operation. Additionally, the ATLBM program is designed with a lower layer to deal with short- and medium-range ballistic missiles using interceptor systems such as the U.S. Patriot. Eventually, it will also have an upper layer to deal with longer-range ballistic missiles, up to 3,000 km, using systems such as the U.S. Terminal High Altitude Area Defense (THAAD) system. Looking ahead at the potential for ALTBMD integration with the U.S. PAA, General Pera said the interfaces between the NATO and U.S. systems have already been successfully tested.

NATO nations contribute sensors and missile interceptor capabilities and fund

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<sup>104</sup> Anders Fogh Rasmussen, NATO Secretary General Monthly Press Briefing, May 5, 2010, [http://www.nato.int/cps/en/natolive/opinions\\_63153.htm](http://www.nato.int/cps/en/natolive/opinions_63153.htm).

<sup>105</sup> David Brunnstrom, "NATO Says Missile Defense Cost Small Price to Pay," *Reuters*, May 5, 2010, <http://www.reuters.com/article/idUSTRE6443LP20100505>.

<sup>106</sup> Julian Hale, "Closing in on a Faster, Better Response: NATO's New ALTBMD Chief Says Interim Capability Faces May Test," *Defense News*, April 10, 2010, <http://www.tmd.nato.int/pera.html>.

those portions of NATO's TMD architecture out of their national defense budgets.

Sensor and TMD missile interceptor capabilities consist of the following: For the interim capability, five nations are contributing weapons systems and sensors: Germany, Patriot Advanced Capability (PAC) -3 missiles; France, SAMP/T missiles; Italy, Horizon-class frigates; the Netherlands, Patriot PAC-3 missiles, Air Defense Command frigates (ADCF); and the U.S., Aegis cruisers, Patriot PAC-2 and -3 missiles, and space early warning systems. In its final configurations, the ALTBMD system will also have the Medium Extended Air Defense System (MEADS) missile weapon systems from the U.S., Germany and Italy; the SAMP/T weapon systems and TPS 77 sensors from Italy; NATO sensors Fixed Air Defense Radar / Deployable Air Defense Radar, Aegis Standard Missile-3 systems, AN/TPY 2 radar and THAAD from the U.S.; Patriot PAC-2 and F100 frigates from Spain; F124 frigates and Global Hawk IR from Germany; and Patriot PAC-2 from Greece.<sup>107</sup>

According to Jane's Defense Equipment and Technology (Jane's), a leading provider of open source intelligence information, the Patriot has a range of 15 km and an extended range of 22 km. The SAMP/T uses the Aster 15 missile and has a range of approximately 20 km. Both systems can defend against short-range ballistic missiles. The THAAD and Aegis SM-3 systems defend against longer range ballistic missiles and have approximate ranges of 200 km and 1,200 km respectively.<sup>108</sup>

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<sup>107</sup> Ibid.

<sup>108</sup> Jane's Defence Equipment and Technology, Jane's Land-Based Air Defence, THAAD, July 5, 2010, [http://www8.janes.com/JDIC/JDET/documentView.do?docId=/content1/janesdata/yb/jlad/jlad0241.htm@current&pageSelected=&keyword=THAAD&backPath=http://jdet.janes.com/JDIC/JDET&Prod\\_Name=JLAD&activeNav=http://www8.janes.com/JDIC/JDET](http://www8.janes.com/JDIC/JDET/documentView.do?docId=/content1/janesdata/yb/jlad/jlad0241.htm@current&pageSelected=&keyword=THAAD&backPath=http://jdet.janes.com/JDIC/JDET&Prod_Name=JLAD&activeNav=http://www8.janes.com/JDIC/JDET) and Jane's Naval Weapons Systems, Standard Missile 3, July 16, 2010, [http://www8.janes.com/JDIC/JDET/documentView.do?docId=/content1/janesdata/binder/jnws/jnws0483.htm@current&pageSelected=&keyword=SM-3&backPath=http://jdet.janes.com/JDIC/JDET&Prod\\_Name=JNWS&activeNav=http://www8.janes.com/J](http://www8.janes.com/JDIC/JDET/documentView.do?docId=/content1/janesdata/binder/jnws/jnws0483.htm@current&pageSelected=&keyword=SM-3&backPath=http://jdet.janes.com/JDIC/JDET&Prod_Name=JNWS&activeNav=http://www8.janes.com/J)

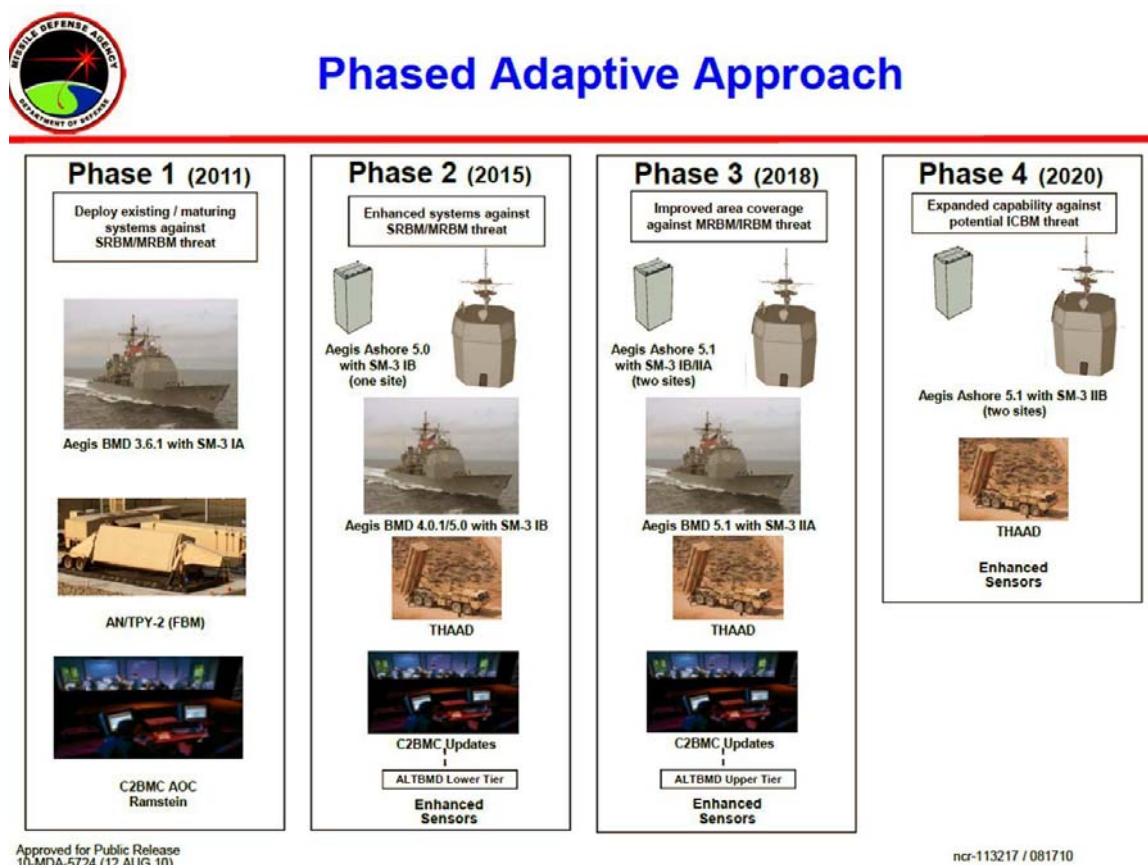
## U.S. Missile Defense Policy: A “Phased, Adaptive Approach” for Europe

In September 2009, President Obama announced a new PAA missile defense policy for Europe. Based upon a comprehensive review of U.S. missile defense plans for Europe and the recommendations of the Secretary of Defense and Joint Chiefs of Staff, the new U.S. policy is guided by two main factors. First, it is based on an updated threat assessment, which emphasizes the threat posed by Iran’s short- and medium-range ballistic missiles rather than the threat from IRBMs or ICBMs. The latter are assessed to have developed more slowly than previously estimated. Second, the PAA is based on advances in missile defense technology, particularly sea- and land-based interceptors and the sensors that support them. The PAA missile defense policy for Europe calls for the following:

- Phase One (in the 2011 timeframe) – Deploy current and proven missile defense systems available in the next two years, including the sea-based Aegis Weapon System, the SM-3 interceptor (Block IA), and sensors such as the forward-based Army Navy/Transportable Radar Surveillance system (AN/TPY-2), to address regional ballistic missile threats to Europe and our deployed personnel and their families;
- Phase Two (in the 2015 timeframe) – After appropriate testing, deploy a more capable version of the SM-3 interceptor (Block IB) in both sea- and land-based configurations, and more advanced sensors, to expand the defended area against short- and medium-range missile threats;
- Phase Three (in the 2018 timeframe) – After development and testing are complete, deploy the more advanced SM-3 Block IIA variant currently under development, to counter short-, medium-, and intermediate-range missile threats; and
- Phase Four (in the 2020 timeframe) – After development and testing are complete, deploy the SM-3 Block IIB to help better cope with medium- and intermediate-range missiles and the potential future ICBM threat to the United States.<sup>109</sup>

Figure 4 depicts the four PAA phases over time from 2011 to 2020. The major C2, sensor and interceptor components of the system scheduled for deployment during each phase are also depicted.

Figure 3: PAA for Europe Overview by Phase



In announcing the PAA, the President emphasized that this new policy was consistent with NATO missile defense efforts, and that he would welcome Russian cooperation to bring their missile defense capabilities into a broader defense of common interests. Also of significance, the President alluded to the adaptable nature of the PAA saying, “Going forward...we will rigorously evaluate both the threat posed by ballistic missiles and the technology that we are developing to counter it.”<sup>110</sup> Similarly, while the

<sup>110</sup> The White House, Remarks by the President on Strengthening Missile Defense in Europe.

White House PAA fact sheet, released in conjunction with the President's announcement, does not mention specifics, it states that the PAA for missile defense in Europe provides flexibility to adjust the architecture as the threat evolves.

Subsequent to the PAA announcement, the U.S. conducted negotiations with several Eastern European countries to host elements of the missile defense system. In February 2010, Romania agreed to host land-based SM-3 interceptors (Aegis Ashore), which is expected to be operational by 2015.<sup>111</sup> In July 2010, the U.S. and Poland signed a similar agreement to place missile defense interceptors in Poland as part of Phase Three of the PAA to be operational in the 2018 timeframe.<sup>112</sup> Finally, the U.S. and the Czech Republic have discussed placing missile defense assets in the Czech Republic and in July 2010, the Czech Prime Minister said he was willing to host an early warning radar as part of an overall NATO missile defense system.<sup>113</sup>

Figure 6 depicts the notional deployment of sea-based Aegis systems with the SM-3 capability in Phase One of PAA, which provides protection for areas of southeastern Europe threatened by Iran's Ghadr-1 MRBM. While the planned location of U.S. Aegis Ballistic Missile Defense (BMD) ships during Phase One is not published information, the statements of Navy officers and past deployments provide some indication of where sea-based capabilities will operate. Admiral Mark Fitzgerald, commander of Naval Forces Europe, said American ships will probably only need to

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<sup>111</sup> Stephen Kaufman, "Romania Agrees to Host Ballistic Missile Interceptor," February 4, 2010, <http://www.america.gov/st/eur-english/2010/February/20100204155405esnamfuak0.8593866.html&distid=ucs>.

<sup>112</sup> U.S. Department of State, Protocol Amending the Ballistic Missile Defense Agreement Between the United States of America and the Republic of Poland, July 3, 2010, <http://www.state.gov/r/pa/prs/ps/2010/07/143945.htm>.

<sup>113</sup> "Czech Republic Ready to Host U.S. Missile Warning Centre: PM," *Agence France-Presse*.

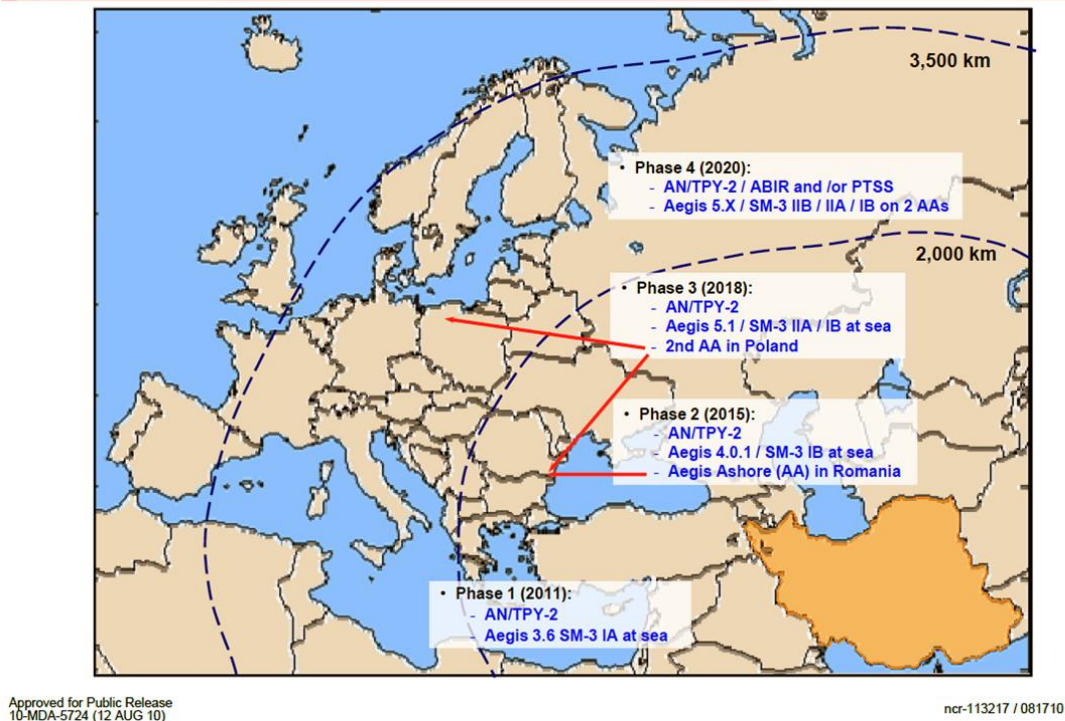


patrol the eastern Mediterranean and the Black Sea.<sup>114</sup> In 2009, the Norfolk, Virginia-based BMD destroyer Stout spent six months in the Mediterranean and Black seas training with Turkish, Romanian and Georgian sailors.<sup>115</sup> The significance of this deployment is that it indicates where BMD ships could operate during Phase One of the PAA. However, as will be discussed later, Black Sea operations could be difficult to sustain in the face of Russian opposition. As depicted in Figure 6, the deployment of land-based Aegis ashore (AA) systems to Romania and Poland in subsequent phases provide protection for Central and Western Europe.

Figure 4: Notional PAA Capabilities Disposition in Europe



## Phased Adaptive Approach In Europe



<sup>114</sup> Philip Ewing, "Officials Consider European Home Ports," *The Navy Times*, April 19, 2010, [http://www.navytimes.com/news/2010/04/navy\\_bmd\\_europe\\_041910w/](http://www.navytimes.com/news/2010/04/navy_bmd_europe_041910w/).

<sup>115</sup> Ronald O'Rourke, "Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress," Congressional Research Service, June 10, 2010, pp. 21-22.

## U.S. Missile Defense Capabilities

The National Defense Authorization Act for Fiscal Year 2010 authorizes \$9.3 billion for missile defense programs, a portion of which supports U.S. missile defense plans for Europe.<sup>116</sup> Similar to the NATO ATLBMD construct, U.S. missile defense capabilities planned for the PAA in Europe consist of a combination of C2, sensors for target detection and tracking, and interceptor missiles. Unless otherwise noted, what follows is a description of U.S. missile defense component capabilities as provided by the Missile Defense Agency (MDA)<sup>117</sup> and the Department of Defense's BMDR. The U.S. capabilities described below are capabilities that are intended for missile defense in Europe, either as part of the PAA or the ALTBMD. Other existing U.S. capabilities such as the Ground-Based Mid-Course Defense (GMD), Ground-Based Interceptor (GBI), and potential new capabilities such as the Airborne Laser (ABL) are not addressed in this section.

The Command and Control, Battle Management, and Communications (C2BMC) program is the overarching ballistic missile defense network that links sensors and interceptors or shooters. The C2BMC also serves a Ballistic Missile Defense System (BMDS) planning tool, a command and control suite that provides a common missile defense picture, and provides for concurrent testing, training and operations. According to the Department of Defense's BMDR, the C2BMC will be interoperable with systems the U.S. develops with allies and partners.<sup>118</sup> Figure 5 depicts the C2BMC and illustrates how the program integrates sensor, interceptor and NATO ALTBMD capabilities.

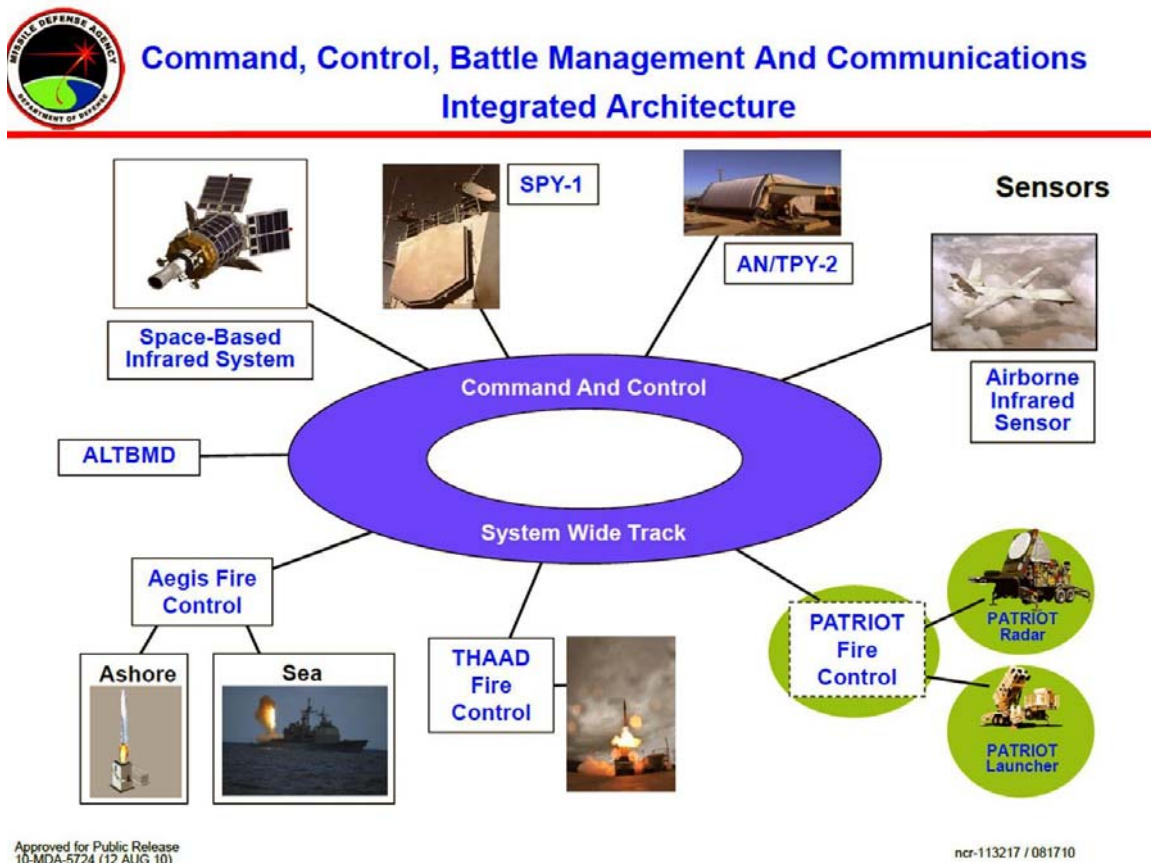
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<sup>116</sup> U.S. House Armed Services Committee, Staff Report, Missile Defense Fact Sheet, 1.

<sup>117</sup> U.S. Department of Defense, Missile Defense Agency, The Ballistic Missile Defense System (BMDS), <http://www.mda.mil/system/system.html>.

<sup>118</sup> U.S. Department of Defense, 2010 BMDR Report, 21.

Figure 5: C2BMC Integrated Architecture



Sensors use a variety of technologies to detect missile launches and track them throughout their trajectory. U.S. sensors include the Army Navy/Transportable Radar Surveillance system (AN/TPY-2), which is an X-Band radar for detecting and tracking ballistic missiles, and interceptor systems which also have an organic radar capability for missile launch detection, tracking and cueing of other sensors and interceptors. For example, the sea-based Aegis weapon system uses the SPY-1 radar to acquire and track targets.<sup>119</sup> The Air Force-operated early warning radar in Flyingdales, United Kingdom also provides ballistic missile launch and tracking data and it detects objects out to

<sup>119</sup> Aegis Missile Guidance System, Raytheon, 2009, [www.raytheon.com/businesses/rtnwcm/.../rtn\\_bus\\_ids\\_prod\\_aegis\\_pdf.pdf](http://www.raytheon.com/businesses/rtnwcm/.../rtn_bus_ids_prod_aegis_pdf.pdf).

approximately 4,800 km.<sup>120</sup>

Interceptor missiles destroy ballistic missiles either by a direct hit (hit-to-kill) or by using an explosive blast fragmentation warhead. U.S. interceptor capabilities include two land-based systems, the PAC-3 and the THAAD system, and one sea-based system, the Aegis BMD with Standard Missile (SM)-3 Block IA interceptor.

The PAC-3, or Patriot system as it is commonly referred, is a U.S. Army-operated system that provides point defense against short-range ballistic missiles. It is the most mature hit-to-kill weapon system in the BMDS and works with the THAAD system to provide overlapping and integrated coverage against missile threats. The Patriot deployed in support of Operation Iraqi Freedom (OIF), where it intercepted several ballistic missiles in conjunction with PAC-2s (which use an explosive fragmentation warhead). In May 2010, a U.S. Patriot battery also deployed to Poland under a 2008 agreement between the U.S. and Poland.<sup>121</sup> According to Jane's, the PAC-3 missile has had nine successful intercepts out of 10 attempts over the past three years and has a range of 15 km; the PAC-3 Missile Segment Enhancement (MSE) has an extended range of 22 km.<sup>122</sup>

The THAAD system is a land-based, long-range system that provides the upper tier of a two-tier missile defense system capable of defending against short- and medium-range ballistic missiles. A component of the system is the AN/TPY-2 radar. The

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<sup>120</sup> U.S. Department of Defense, Missile Defense Agency, Upgraded Early Warning Radars (UEWR), AN/FPS-132 Fact Sheet, June 3, 2010, <http://www.mda.mil/system/sensors.html>.

<sup>121</sup> Gabriela Baczynska, "Poland Says U.S. Patriot Boosts Security," *Reuters*, May 26, 2010, <http://www.reuters.com/article/idUSTRE64P3KU20100526>.

<sup>122</sup> Jane's Defence Equipment and Technology, Jane's Land-Based Air Defense, Patriot PAC-3, July 5, 2010, [http://www8.janes.com/JDIC/JDET/documentView.do?docId=/content1/janesdata/yb/jlad/jlad0242.htm@current&pageSelected=&keyword=Patriot\\_PAC-3&backPath=http://jdet.janes.com/JDIC/JDET&Prod\\_Name=JLAD&activeNav=http://www8.janes.com/JDIC/JDET](http://www8.janes.com/JDIC/JDET/documentView.do?docId=/content1/janesdata/yb/jlad/jlad0242.htm@current&pageSelected=&keyword=Patriot_PAC-3&backPath=http://jdet.janes.com/JDIC/JDET&Prod_Name=JLAD&activeNav=http://www8.janes.com/JDIC/JDET).

THAAD system is capable of shooting down a ballistic missile inside or outside of the atmosphere, and to date the system has completed six successful intercept tests.<sup>123</sup>

The Aegis BMD is the sea-based component of the BMDS and defeats ballistic short-, medium- and intermediate-range ballistic missiles in either the mid-course or terminal phase of their trajectory. To date, there have been 20 successful intercepts out of 24 tests and operational firings.<sup>124</sup> The Aegis BMD is armed with the SM-3 interceptor. According to Jane's, the SM-3 Block 1 missile has a range of about 1,200 km and is able to intercept ballistic missiles at between 70 and 500 km altitude. Its associated radar, the SPY-1, can reportedly track ballistic missiles at ranges in excess of 1,000 km.<sup>125</sup>

Figure 3 shows how U.S. PAA missiles defense capabilities, which provide protection against MRBMs and IRBMs, working with NATO's ATLBMD TMD capabilities, which are focused on defending against SRBMs, provide a layer ballistic missile defense. Figure 3 also shows the U.S.-based outer layer of interceptor defense against the ICBM threat.

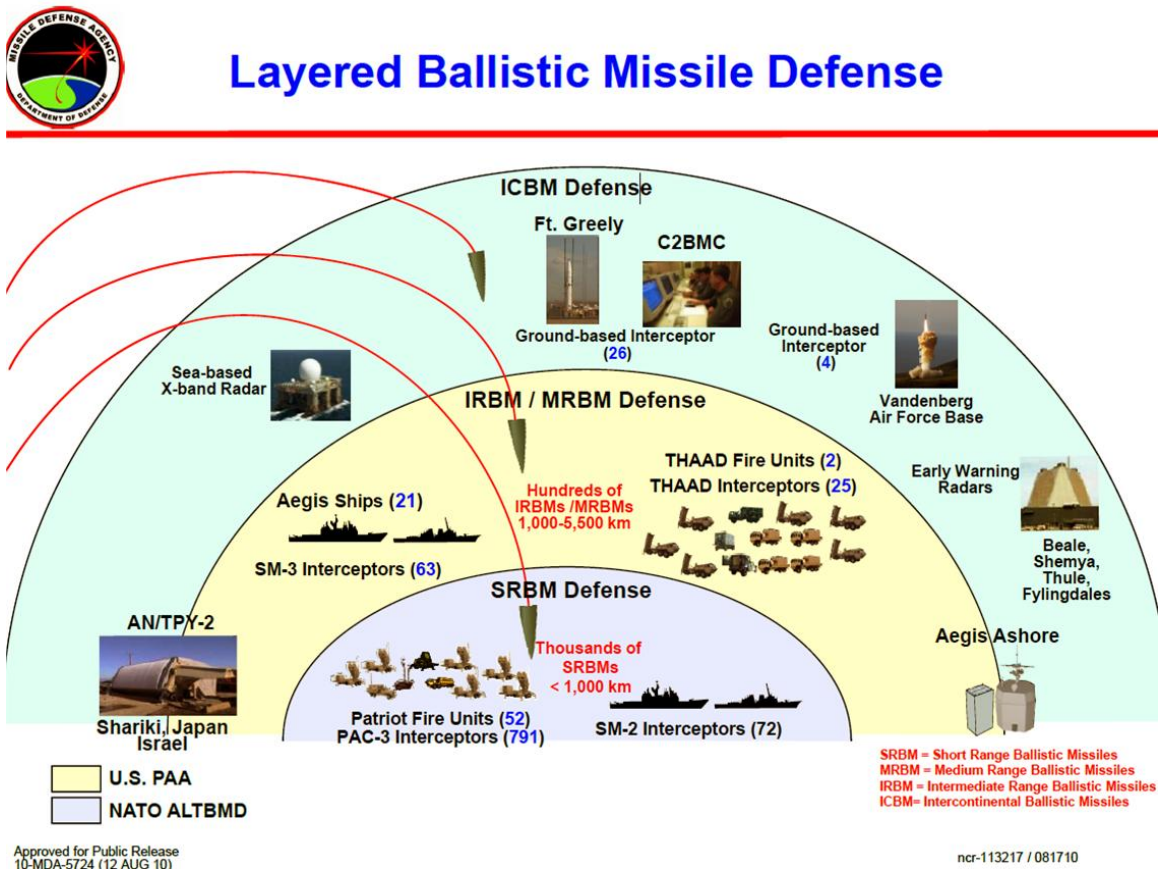
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<sup>123</sup> Jane's Defence Equipment and Technology, THAAD, July 5, 2010.

<sup>124</sup> Jane's Defence Equipment and Technology, Standard Missile 3, July 16, 2010.

<sup>125</sup> Ibid.

Figure 6: Layered Ballistic Missile Defense



Finally, regarding overall U.S. missile defense systems capabilities and U.S. system capabilities against countermeasures such as decoys, in May 2008, Lieutenant General Henry Obering, then Director of the MDA, stated that the effectiveness of MDA's integrated missile defense had been demonstrated through testing with 34 of 42 successful intercepts since 2001. Additionally, he said that six of nine successes were against long-range systems, with four using warhead decoys or countermeasures.<sup>126</sup>

Having presented the NATO and U.S. policies and capabilities, the next section in this chapter examines the views of selected research centers and NGOs. The purpose is to present alternative perspectives on missile defense plans in order to identify potential

<sup>126</sup> Henry A. Obering III, "Response to Missile Defense Malfunction: Setting the Record Straight," Carnegie Council, May 30, 2008, [http://www.cceia.org/resources/journal/22\\_1/special\\_report/002.html](http://www.cceia.org/resources/journal/22_1/special_report/002.html).

gaps or weaknesses in current plans.

### Heritage Foundation

The Heritage Foundation is a Washington, D.C.-based, conservative public policy research and educational institution. Over the past several years, the Heritage Foundation has published multiple assessments on U.S. missile defense policy in general and on U.S. missile defense plans for Europe. Their views are of interest as they generally support more robust missile defense plans than what is planned under the current U.S. administration. What follows is an overview of the Heritage Foundation's key points regarding the U.S. PAA missile defense policy for Europe. These points address missile defense funding, international cooperation, arms control, countermeasure developments, and capabilities to defend against the Iranian ICBM threat.

First, while the ballistic missile threat has increased, U.S. missile defense funding has decreased. For fiscal year (FY) 2011, the Department of Defense requested \$9.9 billion for missile defense with \$8.4 billion going to the MDA. While this amount is an increase over the previous year's budget request, it is nearly \$1 billion less than the FY 2009 request. The budget also reduces or eliminates funding for several advanced technology and space-based programs. For example, in the FY 2011 budget, the Airborne Laser, an advanced and proven technology to destroy an attacking missile early in its flight (the boost phase), is relegated to demonstration status rather than an operational capability. The Heritage Foundation also notes that there is minimal funding in the FY 2011 defense budget for space activities and no funding for space-based interceptors. One notable funding improvement is the \$2.2 billion in FY 2011 for the sea-based Aegis BMD system, a key component of the PAA for Europe. This amount is



an 11 percent increase over FY 2010 funding.<sup>127</sup>

Second, regarding international cooperation and arms control, the Heritage Foundation writes that two important missile defense sites in Poland and the Czech Republic were abandoned under the new PAA policy as part of an effort to “reset” relations with Russia and to advance strategic nuclear arms reduction goals. Under previous U.S. administration’s missile defense plans, Poland and the Czech Republic were to host U.S. missile interceptors and an early warning radar. The Heritage Foundation recommends that Congress not permit arms control efforts or Russian demands to interfere with the missile defense program.<sup>128</sup>

Third, the Heritage Foundation notes that the Department of Defense’s BMDR makes reference to the expansion of ballistic missile countermeasures (such as decoys) that potential adversaries could use to defeat defensive missile systems. However, the report does not describe any U.S. policy that outlines what U.S. programs are being built to be responsive to ballistic missile countermeasure developments. Therefore, it is unclear at the unclassified level whether U.S. missile defense plans for Europe are sufficient to defeat potential Iranian countermeasures.<sup>129</sup>

Fourth, missile defense capabilities deployed initially as part of the PAA for Europe focus on defending against the threat of Iranian short- and medium-range ballistic missiles. As such, the PAA, as currently designed, eliminates the fielding of the ground-based midcourse defense and will not be capable of defeating long-range missiles such as

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<sup>127</sup> MacKenzie Eaglen, “Why Missile Defense,” The Heritage Foundation, August 3, 2010, <http://www.heritage.org/Research/Commentary/2010/08/Why-Missile-Defense>.

<sup>128</sup> Baker Spring, “The Obama Administration’s Ballistic Missile Defense Program: Treading Water in Shark-Infested Seas,” The Heritage Foundation, April 8, 2010, <http://www.heritage.org/Research/Reports/2010/04/The-Obama-Administrations-Ballistic-Missile-Defense-Program-Treading-Water-in-Shark-Infested-Seas>.

<sup>129</sup> Ibid.



an ICBM until 2020 (using the SM-3 Block IIB interceptor). However, several organizations including the Air Force's NASIC, assess that Iran may be capable of launching a long-range missile by 2015. To bolster missile defenses against the ICBM threat, the Heritage Foundation recommends that: a larger number of GMD interceptors be fielded (54, as previously planned, rather than current fielding plan of 30); the SM-3 Block IIB interceptor fielding be accelerated; and that anti-ICBM capabilities also include space-based technology.<sup>130</sup>

#### Center for Strategic and International Studies

The Center for Strategic and International Studies (CSIS) is a bipartisan, nonprofit, public policy research organization headquartered in Washington, D.C. Their views are of interest as they are representative of the centrist perspective on missile defense. In its analysis of U.S. missile defense plans for Europe, CSIS has raised several key issues including arms control versus missile defense balance, missile defense funding, Aegis system capabilities and limitations, and protection against the Iranian ICBM threat.

First, the U.S. PAA for Europe was initially criticized for its apparent abandonment of agreements with Poland and the Czech Republic to place missile defense assets in those countries. To some, the PAA was also viewed as surrender to Russia. However, according to CSIS, recent efforts by the U.S. appear to belie these criticisms. In July 2010, the U.S. and Poland signed a modified agreement to deploy a land-based SM-3 missile defense interceptor system to Poland in the 2018 timeframe. Similarly, the

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<sup>130</sup> Baker Spring, "Two Plus Two Equals Five: The Obama Administration's Missile Defense Plans Do Not Add Up," The Heritage Foundation, September 23, 2009, <http://www.heritage.org/Research/Reports/2009/09/Two-Plus-Two-Equals-Five-The-Obama-Administrations-Missile-Defense-Plans-Do-Not-Add-Up>.

U.S. and the Czech Republic are in discussions about the Czech Republic's future role in the PAA.<sup>131</sup> According to a July 2010 CSIS report, "...the U.S. may have arrived at a compromise that is tenable for everyone; Poland might feel more at ease by having a U.S. missile defense system on its soil; Russia will still have to deal with a missile defense shield on its borders, but in an agreement that may be more palatable because it is directed at short- and medium-range ballistic missile threats (rather than ICBMs that Russia deploys)."<sup>132</sup>

Second, CSIS highlights the cost of the PAA system and notes that there are several unresolved issues related to program funding. The cost of the PAA is largely free for Europe, but the system is expensive for the U.S. What is not clear is how long the U.S. taxpayer will be willing to fund the system for Europe given future reductions in Pentagon budgets, and whether Europeans will plug their own systems into a NATO missile shield or agree to contribute more funds for overall missile defense of Europe.<sup>133</sup>

Third, in Senate testimony in June 2010, Secretary of Defense Gates testified that part of the decision on the PAA was based on the threat that Iran would launch multiple medium-range ballistic missiles rather than just one or two missiles. CSIS notes that as planned in the PAA, the Aegis system would be better able to handle a salvo of Iranian missiles than the limited number of previously planned fixed ground-based long-range interceptor missiles. However, the concern is that the U.S. demand for Aegis ships worldwide exceeds the supply. The Pentagon hopes to eventually deploy up to six Aegis

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<sup>131</sup> Center for Strategic and International Studies, "The Czech Role in Missile Defense," 2010, <http://csis.org/blog/czech-role-missile-defense>.

<sup>132</sup> Anna Newby, "U.S. Signs Modified Missile Defense Plan in Poland," Center for Strategic and International Studies, July 7, 2010, <http://csis.org/blog/us-signs-modified-missile-defense-plan-poland>.

<sup>133</sup> Oliver Bloom, "U.S. Nears Completion of Phase One of Missile Intercept Program in Europe," Center for Strategic and International Studies, August 2, 2010, <http://csis.org/blog/us-nears-completion-phase-one-missile-intercept-program-europe>.

BMD ships in the Mediterranean to counter the threat from Iran, but must also compete with demands for Aegis ships from U.S. Central Command (CENTCOM) for the Middle East and from U.S. Pacific Command (PACOM). Of significance, the Obama Administration hopes to double the number of Aegis missile intercept ships, to 38 by 2015.<sup>134</sup>

Fourth, the CSIS notes that because of the PAA's focus on short- and medium-range ballistic missiles, there is concern about European protection against the Iranian ICBM threat. With intelligence assessments indicating Iran could develop an ICBM capability as early as 2015 and the PAA anti-ICBM capability not scheduled until the 2018-2020 timeframe, CSIS concludes that, "...it appears there is a window of a couple of years in which the United States would not have an ICBM capable missile defense system in the European theater."<sup>135</sup>

#### EastWest Institute

As mentioned in Chapter 2, EWI is an international, non-partisan, nonprofit policy organization. In their May 2009 report titled, "Iran's Nuclear and Missile Potential: A Joint Threat Assessment by U.S. and Russian Technical Experts," EWI analyzes U.S. plans for integrated missile defense in Europe. Because the EWI report was published in May 2009, several of its conclusions and recommendations were addressed by the new U.S. PAA missile defense plan for Europe, which was announced in September 2009. However, their key points regarding countermeasures and Russian concerns about the European missile defense system remain valid and are worth mentioning.

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<sup>134</sup> Ibid.

<sup>135</sup> Center for Strategic and International Studies, "Missile Defense Pragmatism," December 9, 2009, <http://csis.org/blog/missile-defense-pragmatism>.

First, EWI assesses that the proposed U.S. missile shield would be unable to cope with ballistic missile countermeasures that Iran would likely employ. Such countermeasures include: covering the warhead nose with a pointy metallic sleeve or covering other parts of the warhead with radar absorbent material to reduce radar reflections; and employing decoys such as balloons or mock warheads to make the task of target discrimination more difficult.

Second, EWI highlights Russian concerns that the system poses a threat to Russia's national security interest. A principle Russian concern is the visibility that a U.S. missile defense radar in Eastern Europe would have of Russian ICBMs. EWI also assesses that U.S. missile defense assets, perceived by Russia as threatening, might impede progress in other threat reduction areas such as strategic nuclear forces. EWI recommends increasing cooperation with Russia in a variety of ways to include: ensuring UNSC sanctions on Iran are imposed; strengthening the nuclear nonproliferation regime; strengthening the MTCR to restrict export of sensitive missile technologies; persuading Iran, by diplomatic means, to be more transparent with its nuclear program; exploring joint U.S.-Russian responses should Iran expel IAEA inspectors; and investigating the possibility of missile defense cooperation.<sup>136</sup>

#### Russian Perspective

Russia perceives U.S. and NATO missile defense plans for Europe as threatening and as disrupting the strategic balance between the U.S. and Russia. As previously mentioned, Russian's 2010 Military Doctrine identifies NATO expansion and missile defense systems as external military dangers. Further, the statements of Russian leaders illustrate that Russia views missile defense plans for Europe as a threat. Russian officials

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<sup>136</sup> EastWest Institute, Iran's Nuclear and Missile Proliferation, 18.

have also stated that they should have been consulted more regarding missile defense plans for Europe and have suggested proposals for greater joint cooperation. However, in spite of these concerns, Russia is slightly more at ease with European-based missile defense plans under the current U.S. administration, which target short- and medium range ballistic missiles, than they were with the previous U.S. administration's plan, which targeted ICBMs.

As background, in January 2007, Russian General Vladimir Popovkin, commander of Russian Space Forces, stated that a deployment of U.S. missile defense systems to Eastern Europe would be a threat to Russia because U.S. missile defense radar systems would be able to see Russian nuclear forces activity. General Popovkin said, "Our analysis shows that the location of the U.S. base would be a clear threat to Russia."<sup>137</sup>

At his state-of-the-nation address in April 2007, then President Putin linked Russia's suspension of its participation in the Conventional Forces in Europe (CFE) Treaty to U.S. plans for missile defense in Europe. On the Treaty, President Putin said Russia would not adhere to the pact when NATO signatories were ignoring it. Further, he said, "[NATO countries] are ... building up military bases on our borders, and what's more, they are also planning to station elements of anti-missile defense systems in Poland and the Czech Republic."<sup>138</sup> In June 2007, President Putin proposed that the U.S. and Russia operate a joint missile shield and suggested a Soviet-era radar site in Azerbaijan

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<sup>137</sup> "U.S. To Start Talks on Eastern Europe Missile Defence System," *AFP*, January 22, 2007, [http://www.spacewar.com/reports/US\\_To\\_Start\\_Talks\\_On\\_Eastern\\_Europe\\_Missile\\_Defence\\_System\\_999.html](http://www.spacewar.com/reports/US_To_Start_Talks_On_Eastern_Europe_Missile_Defence_System_999.html).

<sup>138</sup> Oleg Shchedrov, "Putin Hawkish in Final State-of-Nation Address," *Reuters*, April 26, 2007, <http://www.reuters.com/assets/print?aid=USL2652472120070426>.

be used to provide real-time early warning information to the joint system.<sup>139</sup>

Still concerned about plans to put interceptor missiles in Poland and a radar system in the Czech Republic, in November 2008, new Russian President Dmitry Medvedev announced plans to deploy missiles to Kaliningrad in response to the proposed U.S. plans.<sup>140</sup> The assumed purpose of this plan was to deploy Russian missiles to a position where they could reach U.S. missile defense assets in Eastern Europe.

In February 2009, Russian Deputy Prime Minister Sergei Ivanov expressed concerns at the Munich Security Conference where he expressed concerns about both the planned deployment of U.S. missile defense systems to Europe and about Russia's perception that the deployment was being done unilaterally without consideration for other parties' interests.

Our principle attitude to the issues of anti-missile defense development remains very much the same. We are confident that the creation and deployment of missile defenses of various types affect directly regional and international security. If one does it unilaterally without due respect of the interests of strategic stability of other parties involved as, for instance, is in the case with fielding of the U.S. missile defense European site, the situation cannot but result in increased tension. The potential U.S. missile defense European site is not just a dozen of anti-ballistic missiles and a radar. It is a part of the U.S. strategic infrastructure aimed at deterring Russia's nuclear missile potential.<sup>141</sup>

More recently, in a sign of de-escalation, at the conclusion of the July 2009 U.S.-Russia Summit, President Obama and President Medvedev "...agreed on a joint statement on cooperation on missile defense, and a joint threat assessment of the ballistic

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<sup>139</sup> Michael A. Fletcher, Putin Offers to Join Missile Shield Effort, *The Washington Post*, June 8, 2007, <http://www.washingtonpost.com/wp-dyn/content/article/2007/06/07/AR2007060700258.html>.

<sup>140</sup> Neil Richard Leslie, "The Kaliningrad Missile Crisis," *Atlantic Council*, November 13, 2008, [http://www.acus.org/new\\_atlanticist/russian-missile-kaliningrad-defense-crisis](http://www.acus.org/new_atlanticist/russian-missile-kaliningrad-defense-crisis).

<sup>141</sup> Sergei Ivanov, "Non-Proliferation of WMD. The Case for Joint Effort," Speech Delivered at the Munich Security Conference, February 6, 2009, <http://www.securityconference.de/Sergej-B-Iwanow.224+M53db17c337d.98.html?&L=1>.

missile challenges of the 21st century, including those posed by Iran...”<sup>142</sup> Additionally, after President Obama announced the new U.S. PAA missile defense plans for Europe in September 2009, President Medvedev canceled his announced decision to deploy missiles to Kaliningrad.<sup>143</sup> President Medvedev called the announcement of the PAA a “responsible approach,” said he was ready to continue to dialogue with the U.S. on missile defense, and made reference to the joint statements that the U.S. and Russia had agreed to in July 2009.<sup>144</sup>

Therefore, while Russian concerns about current and possible future deployments of U.S. and NATO missile defense assets to Eastern Europe remain, they have been somewhat allayed by the new U.S. PAA missile defense plan for Europe and by the spirit of cooperation reflected in the July 2009 U.S.-Russia Summit.

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<sup>142</sup> The White House, Press Conference by President Obama and President Medvedev of Russia.

<sup>143</sup> Oleg Shchedrov, “Russia Won’t Put Missiles in Kaliningrad: Medvedev,” *Reuters*, September 25, 2009, <http://uk.reuters.com/article/idUKTRE58O6ZC20090925>.

<sup>144</sup> “Medvedev Praises Obama’s Move on Europe Missile Shield,” *RIA Novosti*, September 19, 2009, <http://www.inditop.com/world/medvedev-praises-obamas-move-on-europe-missile-shield>.

## CHAPTER 4

### SCENARIOS

Iran is the only country to have developed a missile of this reach [2,000 km] without first having developed nuclear weapons.<sup>145</sup>

International Institute for Strategic Studies, May 10, 2010

#### Introduction

Based on the information presented regarding the nature of the Iranian ballistic missile threat and U.S. and NATO missile defense plans and capabilities, this chapter presents three broad potential scenarios, and several potential branch scenarios, that could evolve in the future. These scenarios address the Iranian ballistic missile threat but also consider Iran's ballistic missiles in the context of the larger threat posed by Iran to regional and international security. This chapter assigns levels of probability (Low, Medium, High, Most Probable) and levels of risk (Low, Medium, High, Most Dangerous) to each scenarios. The three broad scenarios in order of probability are containment, preemption and breakout.

#### Scenario 1: Containment

The most likely scenario is one where current conditions remain essentially unchanged for the next 2-3 years. In this scenario, the U.S. would continue to lead international diplomatic, military and nonproliferation efforts to contain Iran's ballistic missile and nuclear weapons programs. Sanctions will be only moderately successful as companies from countries such as Turkey, Russia, China and India backfill areas left vacant by companies who adhere to sanctions. At the same time, the U.S. will continue to work with allies in Europe and the Middle East to deploy missile defenses to protect

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<sup>145</sup> Chipman, "Iranian Ballistic Missile Capabilities," 1.



against the Iranian ballistic missile threat. Meanwhile, Iran would throughout continue its ballistic missile program and clandestine nuclear weapons program. The Ghadr-1 MRBM will remain the greatest ballistic missile threat to Europe until Iran develops the Sajjil-2 solid-fuel MRBM to an operational status in 2-3 years. Due to international non-proliferation efforts and Iranian technical difficulties, Iran will be unable to develop a nuclear warhead suitable for ballistic missile delivery during this timeframe. Between 2015 and 2020 Iran will likely reach a point in their long-range missile development that they will test an ICBM, but the U.S. will have sufficient lead time about Iranian ICBM development progress based on flight tests and other sources to refine missile defense plans accordingly. (Most Probable/Low Risk)

#### Scenario 2: Preemption

The second potential scenario is one where Israel, perceiving an existential threat from the nexus of Iran's ballistic missile and clandestine nuclear weapons programs, attacks Iranian nuclear sites preemptively. As previously noted, CIA Director Panetta's June 2010 estimate that Iran is two years away from having a nuclear weapon conveyed to Israel how long it would take for Iran to develop its nuclear weapons capability.<sup>146</sup> Such a preemption scenario is not unprecedented as Israel attacked an Iraqi nuclear site in 1981 and a Syrian site in 2007. A preemptive Israeli attack would set off a wave of repercussions including the possibility of: Iranian conventional ballistic missile attacks against Israel, increased Iranian support to anti-Israeli militant groups, attacks by militant groups against Israel, a proxy war in Israel and Southern Lebanon from Hezbollah, negative environmental consequences from radiation plumes, scuttling of ship and mining of the Straits of Hormuz, an increase in oil prices, Iranian reprisals against

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<sup>146</sup> Panetta, Interview with CIA Director on This Week on ABC.

countries perceived as being complicit in the Israel attack, and a redoubled effort post-attack by Iran to rebuild its nuclear weapons capability. The U.S. and NATO could be the target of reprisal attacks, and would get involved to attempt to stop the crisis from escalating and to offer protection to allies in the Middle East against potential Iranian reprisal attacks. (Medium Probability/High Risk)

### Scenario 3: Breakout

While a low probability, the most dangerous scenario is one where Iran, frustrated by long-standing international sanctions, withdraws from the NPT and develops a nuclear warhead and a ballistic missile delivery capability for it. This is the most dangerous potential scenario for several reasons. First, this scenario would result in a nuclear-armed Iran and Iran's past provocative and anti-Western behavior, long-standing animosity toward Israel, ballistic missile capability and support to various militant groups makes it possible that Iran would make use of such a capability. Such uncertainty would be highly likely to result in an arms race throughout the Middle East and Europe as countries would increase their missile defense capabilities, offensive ballistic missiles, and nuclear capabilities to keep pace with Iran. Second, if Iran were to take this approach, Israel, feeling an existential threat, would likely attack Iran preemptively to prevent Iran from obtaining such a capability. The consequences of this action by Iran and the reaction by Israel are discussed more in the preemption scenario above. Third, if Israel attacked Iran preemptively after Iran had acquired a nuclear-capable ballistic missile, then the probability is increased that Iran would respond by using a nuclear weapon against Israel either on a ballistic missile or through one of its proxy groups. It is this third point that makes this scenario the most dangerous. (Low Probability/Most Dangerous)

One caveat is worth mentioning regarding a notional Iranian nuclear-armed ballistic missile. In terms of Iranian leader decision-making on a method to attack Israel, the research suggests Iran's ballistic missiles lack accuracy. Therefore, Iranian leaders, concerned about the potential for collateral damage to Muslim holy sites in Israel, could choose a more accurate method to attack Israel, either a short-range missile attack from a boat in the Mediterranean or by proxy group from Lebanon or the Palestinian Territories.

#### Other Branches and Possibilities:

The potential scenarios mentioned above illustrate the major events that could transpire in the future, including the scenarios assessed as being the most probably and the most dangerous. However, there are a number of other branches from these scenarios, or separate scenarios entirely, that bear mentioning. They are mentioned briefly below with their assessed levels of probability and impact.

- Iran's ballistic missile and nuclear weapons programs prompt other countries in the Middle East to pursue missile defense capabilities, offensive ballistic missile programs and nuclear options. (High Probability/Medium Risk)
- The U.S., NATO, Russia and others intensify cooperation on missile defense and sanctions against Iran; increased pressure results in greater Iranian cooperation with the international community. (Medium Probability/Low Risk)
- U.S. attacks Iranian nuclear sites preemptively to set back Iran's ability to obtain a nuclear-armed ballistic missile capability; Iran conducts reprisal attacks against U.S. interests in the Middle East, increases support to anti-U.S. militant groups in Iraq and Afghanistan, and redoubles effort to build its ballistic missile and nuclear weapons capability. (Low Probability/High Risk)

- Iran's long-range ICBM capability matures to the point where Iran develops and tests an ICBM by 2015; U.S. and Europe are vulnerable to attack until anti-ICBM interceptors can be deployed to Europe. Of note, should Iran develop a nuclear weapon, then the risk of this scenario would increase to high. (Low Probability/Medium Risk)
- Iran's long-range ballistic missile capability does not mature; Iran attacks coastal area using a proven short- or medium-range ballistic missile through unconventional means using a ship or proxy group. As noted above, should Iran develop a nuclear weapon, then the risk of this scenario would increase to high. (Low Probability/Medium Risk)
- International pressure and internal Iranian dissatisfaction results in generally non-violent Iranian regime change; the new Iranian government increases transparency resulting in a reduced ballistic missile threat and greater cooperation with the international community. (Low Probability/Low Risk)
- Current international sanctions against Iran are successful; Iran agrees to international monitoring and rigid stipulations for its nuclear and ballistic missile programs. (Low Probability/Low Risk)

### Conclusion

This paper concludes that the most probable scenario is containment, where the U.S. would continue diplomatic, non-proliferation and missile defense efforts in Europe and in the Middle East to contain the threat posed by Iran's ballistic missile and nuclear weapons programs. The most dangerous scenario is breakout where Iran would withdraw

from the NPT and declare its intent to develop a nuclear weapon and ballistic missile delivery system.

Additionally, containment clearly is a preferable option to preemption. First, Allies lack incontrovertible evidence regarding the Iranian threat, which would be needed to justify preemption. Second, the UN certainly would not endorse military action against Iran unless Iran was to carry out a specific and egregious breach of international security such as an attack on another country, and even then the issue could be highly problematic. Third, the consequences of preemption would be very costly and unpredictable. Fourth, while containment has worked in the past as in the case of the Soviet Union, preemption as in the case of Iraq has led to the drawn out and costly deployment of U.S. forces, the final outcome of which may not be known for years.

## CHAPTER 5

### CONCLUSIONS AND RECOMMENDATIONS

It may be that their [Iran's] ideological commitment to nuclear weapons is such that they are not making a cost-benefit analysis.<sup>147</sup>

President Barack Obama, August 4, 2010

#### Introduction

This chapter draws conclusions about the threat posed by Iran's ballistic missile program and U.S. and other Allies' missile defense plans for Europe. Where appropriate, this chapter makes recommendations for policymakers and planners in considering the missile defense mission and other ways to effectively deal with the threat posed by Iran's ballistic missile program.

#### Missile Defense Plans Sufficient Against Iranian MRBMs; Uncertain Against ICBMs

From a technical capabilities standpoint, at the present time and for the next 2-3 years, the greatest Iranian ballistic missile threat to Europe is from Iran's Ghadr-1 (Shahab-3 variant) MRBM with a range of approximately 2,000 km. The Ghadr-1 could reach southeastern Europe including parts of Greece, Bulgaria and Romania. If deployed in sufficient numbers, the sea-based Aegis Weapon System, the SM-3 interceptor (Block IA) and associated sensors as called for in Phase One (2011) of the PAA are sufficient to defend against an MRBM attack from Iran. A combination of Aegis patrols in the Mediterranean and Black Seas would provide optimal Aegis BMD coverage for southeastern Europe. Operationally however, a U.S. BMD employment strategy that relies heavily on the Black Sea could meet with Russian opposition due, in part, to the

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<sup>147</sup> "Sanctions on Iran are Tough, but How Much Effect Will They Have?" *The Washington Post*, August 5, 2010, <http://www.washingtonpost.com/wp-dyn/content/article/2010/08/04/AR2010080406405.html>, A16.

presence of Russia's Black Sea Fleet and its base in Sevastopol. Strategically, Russia also views the Black Sea as being within its sphere of influence. A sub-optimal, but acceptable, Aegis deployment would be patrols based solely in the Mediterranean Sea. Phases Two and Three of the PAA call for the deployment of the more capable land-based SM-3 interceptors in Eastern Europe (likely in Romania and Poland). Of significance, the land-based SM-3 capabilities planned for Phase Two (in the 2015 timeframe) will render unnecessary the potentially contentious Black Sea Aegis BMD patrols.

Regarding the Iranian ICBM threat, assessments vary regarding Iran's ICBM development timeline. While unlikely, multiple credible assessments state Iran could develop an ICBM by 2015; others say it could be 2020 before Iran develops an ICBM capability. If intelligence assessments are correct and Iran develops an ICBM by 2015, U.S. and NATO missile defense plans for Europe would not, under the current phased approach, be sufficient to defend against an ICBM attack from Iran for the 2015-2020 timeframe. This is due to the fact that the PAA will not deploy an anti-ICBM capable system (the SM-3 Block IIB) until Phase Four in the 2020 timeframe.

However, there are a number of technical and scientific steps that Iran would need to take prior to achieving an ICBM capability. These steps include the development of advanced and larger rocket motors; improved flight control, guidance systems, and telemetry; reentry vehicle heat protection; and a series of flight tests over several years.<sup>148</sup> Given the visibility of these steps -- particularly flight tests -- and heightened intelligence collection against Iran, it is likely the U.S. will be able to refine the

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<sup>148</sup> EastWest Institute, 9.

timeframe for when Iran will develop an ICBM capability and adjust its missile defenses and other options accordingly.

Recommendations: The U.S. and NATO Allies should sustain robust intelligence collection on Iranian long-range missile development to detect Iranian progress. Additionally, NATO should adopt the missile defense mission and merge U.S. PAA missile defense plans into the broader NATO missile shield. Finally, in order to draw out Iranian ballistic missile development timelines, the U.S. and NATO should increase efforts to strengthen international missile non-proliferation initiatives, which currently consist of the MTCR, the HCOC and the PSI.

#### Iranian Ballistic Missile Capability Clear; Intent Mixed

While Iran clearly has short- and medium-range ballistic missile capabilities and is working toward developing longer range ballistic missiles, Iranian leaders have given no indicator of any intention to attack Europe, and such an attack is highly unlikely. Iranian leaders have emphasized that their ballistic missile forces are for defensive purposes. Iran views regime survival as paramount, and likely realizes that NATO retaliation for an Iranian missile attack on a NATO Ally would seriously jeopardize the regime. An assumption is that Iran sees an increasingly capable U.S. and NATO missile defense system for Europe, which may also deter an Iranian attack since Iran could expect only a small probability of success against a high probability of retaliation. Iran views its own ballistic missile capability as a symbol of prestige in the Middle East. Based on perceived past ballistic missiles successes during the Iran-Iraq War and the Persian Gulf War, Iran also sees its ballistic missile capability as a means to intimidate its neighbors and as an asymmetric weapon to compensate for weak conventional forces.



In a larger sense, Iran sees its position in the Middle East as being bolstered by the removal of longtime antagonist Saddam Hussein in Iraq and of the Taliban in Afghanistan. However, Iran feels pressured by the deployment of U.S. forces so near its borders and has become even more intransigent in dealing with the West in general, and on its missile and nuclear programs in particular. Additionally, Iran's lack of transparency, misleading statements, and tendency to exaggerate its capabilities makes assessments of Iranian ballistic missile capabilities and intent difficult.<sup>149</sup> Meanwhile, the uncertainty surrounding the military dimension of Iran's nuclear and ballistic missile programs continues to engender diplomatic pressure on Iran, rigorous intelligence collection of Iranian capabilities and intent, and missile defense deployments to protect against a potential Iranian attack.

Iran's intent is even less certain when it comes to Israel. Iranian leaders have made threatening statements toward Israel in the past, and Iran's support to anti-Israeli militant groups is well established. As such, many Israelis fear that Iran has the capability and intent to attack Israel. However, analysts consider that Iran's ballistic missiles, lacking modern guidance systems, may not be accurate. Despite public statements to the contrary, Iranian leaders probably understand their ballistic missile accuracy limitations. That fact, combined with Iranian concerns over potential collateral damage to Muslim holy sites in Israel, would probably enter into their calculus of whether to use a ballistic missile (nuclear or conventional) against Israel.

Recommendations: The U.S. and NATO should work closely with Turkey, Russia, China and India to find common ground on an approach to the sanctions' implementation against Iran for them to be effective. The current strategy of economic

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<sup>149</sup> Chipman, "Iran's Ballistic Missile Capabilities: A Net Assessment," 2.

sanctions against Iran to pressure the regime for greater cooperation and transparency in their nuclear and ballistic missile programs can work if given time and if sanctions are adhered to. However, as it stands, the desired impact of sanctions is lessened by Iran's dealings with countries such as Turkey, Russia, China and India whose policies differ from the U.S. in terms of sanctions implementation. The U.S. also should intensify cooperation with Israel on intelligence exchanges, threat assessments and operational planning.

#### Iranian Ballistic Missiles Part of Larger Threat

Iran's ballistic missiles, along with Iranian proxy groups, are tools for Iran to project power beyond its borders and exert influence in the region. The fact that Iran's ballistic missile program has the technical capability to threaten southeastern Europe and the Middle East is only part of a larger threat posed by Iran. It is the combination of Iran's ballistic missile capability with a potential nuclear warhead that is the larger concern. Director of National Intelligence Dennis Blair's remarks in February 2010 about Iran's nuclear program are worth repeating. He said, "We continue to assess Iran is keeping open the option to develop nuclear weapons in part by developing various nuclear capabilities that bring it closer to being able to produce such weapons, should it choose to do so. We do not know, however, if Iran will eventually decide to build nuclear weapons."<sup>150</sup>

The issue of the possible threat to attack Europe aside, the larger threat from Iran from the U.S. perspective is the destabilizing influence that a nuclear-armed Iran would have in the Middle East, and potentially globally. Negative repercussions of a nuclear-

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<sup>150</sup> Dennis C. Blair, Director of National Intelligence, Annual Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence, February 2, 2010, 13.

armed Iran could include: greater perceived insecurity in the Middle East resulting in higher oil prices; the potential for a nuclear arms race in the Middle East whereby other countries initiate nuclear programs to counter-balance Iran's capability; and the potential that Iran as a nuclear power might share either nuclear materials or nuclear know-how with surrogates or other rogue actors.

Recommendations: The U.S., NATO and Middle Eastern allies should increase cooperation to develop joint threat assessments of Iran's capabilities and intent and should coordinate joint responses to Iranian sanctions violations and to a potential Iranian withdrawal from the NPT.

#### NATO Will Likely Agree to Missile Defense Mission

NATO will probably agree to make missile defense a NATO mission at the Lisbon Summit in November 2010. However, there are several factors which may inhibit this decision including differences between agreed NATO threat perceptions and views of individual Allies vis-à-vis Iran, and missile defense funding. First, while NATO consensus documents in the past have noted concern with Iran's nuclear and missile programs, not all NATO members agree fully that Iran poses a direct threat to Europe. Turkey is the obvious example. Turkey's threat perception is much less and its resultant policy stance toward Iran is much more cordial than that of NATO writ large. If the NATO Summit dialogue surrounding the missile defense mission is more general, rather than specifically directed at Iran, then Turkey would be more likely to support it. On the other hand, a missile defense approach focused on Iran could inhibit Turkey's support. Eastern European and Baltic NATO members probably will not balk at a missile defense mission directed at Iran, but will stress their concern about Russia. Finally, while

unlikely, funding could be a factor which inhibits agreement on the missile defense mission. Certainly it will be a topic of discussion given the current economic environment.

If NATO decides to make missile defense a NATO mission, it will probably result in NATO's current ALTBMD TMD mission being combined with the U.S. PAA plans in order to cover the larger NATO territorial defense mission. However, the NATO decision probably will not result in a significant change in NATO missile defense assets and capabilities. From a funding standpoint alone, NATO could not do it otherwise. The U.S. currently spends over \$9 billion per year on missile defense. NATO's Secretary General has proposed spending 200 million Euros (approximately \$250 million) over the next 10 years to fund the NATO missile defense mission. Additionally, the trend among European allies is to decrease overall defense budgets so a large increase in NATO defense expenditures to support missile defense-related costs is unlikely and is probably unnecessary given redundancies it could create with planned U.S. PAA capabilities.

An issue likely to arise during NATO missile defense discussions is what national contributions Allies will make to the new missile defense mission. As noted previously, the PAA's demands for Aegis BMD ships will probably strain the U.S. Navy's ability to provide BMD coverage for U.S. Combatant Commanders worldwide until the number of BMD-capable ships is increased. European allies have sea-based BMD capabilities and those assets could lessen the strain on U.S. Navy ships where demand exceeds supply.

Recommendations: Careful analysis is required to determine where and how Allies' national missile defense assets can be incorporated into the larger NATO missile defense shield and where efficiencies are achievable in terms of using Allied systems in

lieu of U.S. systems or vice versa.

### PAA Is a Partnership Opportunity

The PAA focuses initially on the threat from Iran's short- and medium-range ballistic missiles and later in Phase Four on the Iranian ICBM threat. However, the PAA is only one part of the overall U.S. strategy to contain Iran. Other components of the strategy include diplomacy, international sanctions, and non-proliferation efforts. To be successful, the U.S. strategy requires Allies' participation. In that vein, in addition to being threat-focused, the PAA presents a strategic partnership opportunity; a chance to increase cooperation with U.S. Allies on common security concerns and at the same time provide for their protection against the threat of ballistic missiles.

Recommendation: The U.S. and NATO should use missile defense in Europe to deter and protect against the Iranian ballistic missile threat, and also to build up relations and improve strategic cooperation with Allies. Poland, Romania and the Czech Republic are obvious examples of countries who have expressed an interest in strategic cooperation with the U.S. on missile defense. The U.S. should seize these opportunities and look for other countries in Europe where missile defense makes sense as a tool to be used for threat mitigation and also to enhance Allied strategic cooperation.

### Russia: Angst over Missile Defense; Possible Key to Iran

The previous U.S. administration's missile defense plan for Europe caused great angst in Russia because it called for the deployment of a radar capability in Eastern Europe that would have had the capability to monitor Russian ICBMs. Russia also felt the previous plan was announced unilaterally rather than in a coordinated, bilateral or multilateral way. Further, Russia viewed the previous plan as an initial capability that

would have paved the way for further U.S. expansion of missile assets in Eastern Europe and worldwide. Russia seems slightly more at ease with the new PAA for Europe. The PAA's approach is different from the previous plan in that it focuses initially on the threat posed by Iran's short- and medium-range ballistic missiles. Not until Phase Four would the PAA counter ICBMs. However, recent U.S. agreements with Poland, Romania and the Czech Republic to place PAA missile defense capabilities in their countries in future PAA phases will likely create additional tension with Russia. This point of tension probably will occur at some point in the future but prior to the actual deployment of these capabilities.

Taken together, U.S. missile defense plans for Eastern Europe, NATO expansion into Eastern Europe and the Baltic Region, and the U.S. withdrawal from the ABM Treaty all have contributed to Russian threat perceptions as articulated in Russian's 2010 Military Doctrine.

Recommendations: The U.S. and NATO should intensify efforts to increase cooperation with Russia on missile defense and on Iran more generally. In fact, the analysis suggests that U.S. engagement with Russia on the larger Iranian issue is key to a true breakthrough with Iran due to political, security and especially economic ties that Russia has to Iran and the leverage that gives to them.

### Conclusion

Iran's ballistic missile program is a growing threat to regional and international security. The possibility of a nuclear-armed Iran greatly exacerbates this threat. Missile defense is an important component of the overall strategy to mitigating the threat; other components include diplomacy, economic sanctions and non-proliferation efforts. Policy

options for dealing with Iran also are wide-ranging from containment to rapprochement to preemption. This advanced research project has presented information and analysis on the threat, Allied missile defenses, and potential future scenarios for policymakers and planners to consider as they formulate strategy vis-à-vis Iran going forward.

The PAA represents a missile defense compromise that accepts some near-to-mid-term risk in the event Iran develops an ICBM by 2015, but it may avoid hard-line Russian resistance. At the same time, the PAA reassures U.S. Allies by making substantial U.S. contributions to missile defense which will provide for their protection. With the goal being improved regional and international security, NATO should accept the missile defense mission in November 2010, incorporate the U.S. PAA plan into a larger NATO missile defense umbrella, and actively engage Russia on missile defense cooperation and policy vis-à-vis Iran more broadly.

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